UNITED STATES ARMED FORCES MEDICAL JOURNAL

Volume VII May 1956 Number 5

PSYCHOLOGIC CONSIDERATIONS IN ATOMIC WARFARE

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THE trend of world events in the atomic age forces the inevitable conclusion that in future combat military medicine must be prepared to care for mass casualties of a magnitude and abruptness which far exceed any previous experiences in conventional warfare. In planning to meet this challenge, the types and numbers of physical injuries to be expected can be reasonably estimated from the quantities of heat, blast, and radiation that will be unleashed by the atomic explosion. However, the effect of the psychologic trauma accompanying such a destructive weapon in producing mental breakdown or otherwise adversely influencing behavior is not so susceptible of measurement or prediction. Yet the emotional state of the relatively uninjured survivors in atomic attack is of primary consideration, because only by their efforts can there be prompt reorganization for lifesaving aid to and rescue of the seriously injured, or for any effective defense against an immediate enemy assault exploiting such a tactical situation.

MATERIALS

There has been little or no experience with behavior under conditions of atomic disaster. For this reason the reactions of military and civilian groups who have been subjected to episodes of catastrophic trauma were studied in an effort to ascertain the general characteristics and operational determinants of behavior under severe stress that could be applied to the control of mass psychologic disorders in atomic warfare. Relevant data are available from the following sources.

Combat. Beginning with "shell shock" in World War I[1] and continuing through World War II[2] and Korea,[3] there have been numerous observations and studies of troops exposed to varying degrees and types of battle stress. As a consequence, considerable

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knowledge has accumulated relative to the circumstances in combat that are most favorable for the occurrence of psychologic breakdown, now termed combat fatigue or combat exhaustion.

Aerial Bombardment. Information is available relative to behavioral reactions during and after air strikes against population centers. These data, almost entirely derived from the psychologic impact of bombing raids on Germany, England, and Japan during World War II, have been summarized by Janis.[4]

Civil Disaster. Field investigations have been made of unforeseen or spontaneously occurring civil disasters such as fires, explosions, hurricanes, tornadoes, and floods. In 1952 the National Research Council[5] established a Committee on Disaster Studies which has functioned as a clearinghouse for the dissemination of field research data obtained from recent civil disasters and which has stimulated investigation in this sphere. As a result of these efforts, a better understanding of behavioral patterns in severe stress based on time and space considerations has emerged.[6, 7]

Hiroshima and Nagasaki. There are only a few reported observations of behavior from these two experiences of actual atomic warfare.[4, 8–10] Nevertheless they are of special importance for our purposes because they afford an opportunity to compare psychologic reactions due to atomic attack with behavior in other major traumatic situations.

PANIC

From the foregoing source material, certain generalizations regarding behavior can be made, because they have been consistently noted in most situations of severe trauma irrespective of their cause or of the culture of the group involved. The first general conclusion concerns the phenomenon of panic, usually defined as uncontrolled flight or frantic, purposeless activity. It has been repeatedly observed that instances of mass panic are relatively rare in disaster situations[4, 11, 12] and mainly occur under special circumstances which involve the element of partial entrapment. Favorable conditions for mass panic are established when persons are faced with an immediate threat of destruction, actual or perceived as such, in a situation where there is either a rapidly narrowing or a limited escape route but one believed to be open to safety. Under these conditions, there is precipitous flight to avoid danger. But when the escape route becomes blocked, frantic, irrational activity frequently results. Such panic behavior quickly becomes widespread, persons involved are pushed and trampled on, and rational thought disappears. None of the foregoing statements should be taken to indicate that precipitous flight to avoid imminent destruction is in itself panic behavior so

long as such activity is controlled or directed away from danger. Indeed, instantaneous flight may be the best possible adaptation for survival under threatening circumstances.

EMOTIONAL BREAKDOWN

A second empirical conclusion that can be drawn from past experiences of behavior under stress refers to the occurrence of chronic mental illness. Available source data strongly indicates that psychoses, prolonged depressions, and chronic neuroses are not caused by acute catastrophic situations. The incidence of these chronic psychiatric diseases, as reflected by admission rates to mental hospitals, was not particularly increased during World War II in England, Germany, and Japan;[4,13,14] neither did severe or persistent mental disease result from the atomic bombing of Hiroshima or Nagasaki, nor did such illnesses occur following the civilian disasters that have been studied in this country.

A third generalization of behavior under stress can be set forth because observations and reports are in essential agreement that the most frequent psychologic abnormality noted in traumatic situations is a temporary emotional disruption.[4] Persons so affected exhibit disturbances of function with manifestations that vary in severity from stunned, mute behavior or uncontrolled, purposeless flight to trembling tearful helplessness, apathetic depressed states, inappropriate activity, or preoccupation with somatic symptoms of emotional tension. Typically, such disorders are temporary, changeable reactions which are self-limited, lasting for minutes, hours, or days, and more rarely, weeks. Because they are disorganized or helpless, these persons are readily influenced by the attitudes of others, a fact that has practical application for the control of their symptoms and non-effective behavior following the cessation of danger.

While recovery from temporary emotional breakdown and return to functional capacity usually takes place within one or several days, residual manifestations that involve undue sensitivity to danger stimuli are common. These residue are usually evidenced by an increased state of apprehension which in some persons produces insomnia, heightened irritability, poor appetite, weight loss, and diminished work efficiency. Persons with more severe residual apprehension may absent themselves from work in a potential target area or seek relief by moving to another location of presumed safety. In most persons residual apprehension gradually diminishes over a period of weeks.

FEAR

A fourth general characteristic of behavior under stress involves the frequency of, and the problem presented by, fear. When

the definition of fear is restricted to include distressing somatic and/or mental sensations, most observers and investigators of combat and civilian[4,12] disaster found that either the majority of people subjected to severe external trauma admitted that they experienced fear reactions, or its presence could be reasonably inferred from their behavior during the stressful period. However, fear reactions do not necessarily prevent effective and even extraordinarily courageous behavior, although it can be convincingly argued that the uncomfortable, subjective sensations of fear can only hinder rather than aid a person in his adaptation to a traumatic situation. For reasons that will be discussed later, it is herein postulated that a sufficient intensity of fear with its painful and inhibitory effect is the usual precursor out of which arises the transient emotional breakdown from severe external stress. The widespread occurrence of fear among persons exposed to danger can be considered a reservoir or a potential source of psychologic casualties.

The data thus far presented may be summarized by stating that the characteristic and common psychologic abnormalities produced by traumatic or disaster conditions include transient, fluid states of mental disruption and residual sequelae of increased apprehension. Similar psychologic problems should be expected in atomic warfare. The greater physical, and therefore more intense psychologic, trauma produced by nuclear weapons argues for increased and perhaps more severe psychiatric casualties than were noted in conventional warfare. Conversely, the brief duration of atomic stress as contrasted with the lengthy periods of tension and danger incurred under usual battle conditions would indicate a lessened frequency of psychologic disorders in atomic warfare. It is possible that the over-all incidence of emotional breakdown, as well as of physical injuries, will be similar in both types of warfare, with the major difference arising from the capacity of atomic weapons to cause large numbers of all types of casualties rapidly and in one location, as contrasted with the fluctuating but relatively constant smaller number of casualties that are produced from day to day over many areas of the battlefront in conventional combat. Obviously, if both conventional and nuclear weapons are used in tactical combat situations, along with atomic attack upon rear or support troops, an increase in psychologic as well as physical casualties can be expected.

Ideally, the prevention and treatment of these induced psychologic disorders should be based on control of causative agents and on measures to favorably influence the sustaining forces that maintain emotional equilibrium during such trying circumstances. However, the precise information required to implement such a

program is as yet unavailable because there is insufficient factual knowledge concerning the physiologic, psychologic, and sociologic mechanisms involved in individual and group reactions to severe external trauma. Reliance must still be placed on the previous observations and experiences of behavior under stress. It is mainly from these empirical data that the following operational approach to the problems of adaptation in atomic warfare is postulated.

IMMEDIATE RESPONSE TO THREAT

Consider first behavior during and immediately after the impact of a nuclear explosion. For explanatory purposes, the mental process involved in responding to external stimuli can be divided into three sequential time phases, namely, perception, evaluation, and initiation of action. Usual or innocuous environmental changes evoke, when needed, rapid and appropriate responses in which evaluation plays little or no role as such because of automatic decision-making mechanisms that have been established through prior learning. However, new and abrupt situational changes require evaluation, and consequently there is an appreciable time lapse exhibited by most persons in their endeavor to respond to unusual stimuli. When abrupt environmental change is associated with a serious threat to life, experience indicates that the mental processes are significantly altered so that responses are either accelerated or inhibited. According to Rioch[15] this well-known and seemingly paradoxical phenomenon can best be explained by assuming that danger first produces an alerting reaction that operates simultaneously on the several components of the mental process to (1) focus the attention on pertinent elements of the threatening environment, thus narrowing the field of perception; (2) potentiate evaluation so that rapid decisions can be made; and (3) mobilize the bodily mechanisms for heightened and sustained physical activity.

When a person cannot cope with the danger because of the magnitude of the threat, other unalterable circumstances in the situation, or lack of confidence, the urging force contained in the alerting action promptly becomes transformed into the subjective, distressing physical and mental sensations of fear. Fear tends to interfere with the evaluatory function of the mental process. Even minor decisions become more difficult to make, and suggestibility, docility, and helpless dependency are common. Similar inhibitory sensations occur in the somatic sphere; the legs may feel rubbery and weak, speech is restricted, and breathing may be labored and difficult.

TYPES OF FEAR RESPONSES

On the basis of the foregoing concepts, supported by observations in combat, behavior under the sudden impact of danger can

be reconstructed as follows. In about 15 to 25 per cent of exposed persons, prompt, purposeful responses are evoked which continue on into sustained effective activity.[6,16] Such persons apparently have a superior capacity to quickly grasp relevant details of a dangerous situation and can make rapid, appropriate decisions which will be promptly translated into immediate action. These effective participants in a disaster situation are "too busy" to feel fear during the period of danger, although soon after the emergency has passed some may note fear reactions on contemplating their narrow escape, while others appear excited and even elated as they eagerly discuss the events that have recently transpired.

The majority of persons confronted with sudden danger are stunned or bewildered[6] because they require an appreciable time to evaluate the situation. This inability to cope promptly and adequately with external threat produces acute inhibitory fear reactions which further burden the evaluatory process. With the passage of varying but brief periods of time and a consequent better grasp of their surroundings, most persons regain sufficient control to permit such goal-directed efforts as precipitous flight away from danger or quick movement to a place of presumed safety. While immediate concern is usually for self-survival, very soon thereafter social consciousness is reawakened in many persons who, even though handicapped by distressing fear, nevertheless perform unselfish acts in behalf of loved ones, comrades, friends, and even strangers. Military experience strongly indicates that with the resumption of purposeful activity, fear is diminished or dissipated. It would seem that when a person responds correctly to the urgent demands of the situation, tension is discharged. On the other hand, inaction under threatening circumstances fosters the building up of fearful sensations which only inhibit further, and thus a vicious cycle of worsening noneffective behavior is established.

BASIS OF FEAR REACTION

Psychologic breakdown occurs in those persons subjected to severe traumatic conditions who are unable to mobilize appropriate evasive or aggressive action and who in addition cannot tolerate the consequent intense fear reaction. Persons so affected do not suffer a literal breakdown of psychic function but exhibit a more primitive behavioral pattern that permits a decrease of personal involvement with intolerable reality. Emotional disorders of this type can be interpreted as meaningful behavior which has for its purpose the maintenance of the organism in situations of extreme personal discomfort, even though such an adaptation may be deleterious insofar as survival is concerned. Support for this hypothesis has been furnished by Rioch,[17] who

stated that neurophysiologic mechanisms do not permit random or unorganized activity except possibly for a few seconds during transition from one organized functional pattern to another of a higher or lower level of integration. Psychologic breakdown represents such a shift, from a highly organized flexible behavior capable of memory and judgment and presuming control by the cerebral cortex, to more simplified and stereotyped behavioral patterns associated with lower levels of integration such as are mediated by subcortical centers and the brain stem.

The mute, stunned reaction commonly observed under disaster conditions illustrates the purposeful nature of these stress-induced psychologic abnormalities. Here the involved person appears to isolate himself from the chaotic situation by apparently blocking the perception of external stimuli. Such persons are described as unemotional, blank, dazed, unresponsive to painful stimuli, and oblivious of any injuries that may have incurred.[13] Even more primitive is the uncontrolled, frantic behavior noted under catastrophic circumstances when the affected person seemingly responds to stimuli without discrimination, as if cortical control were lost and function were integrated at the brain stem level. Less severe forms of emotional disorder due to stress are characterized by a childish type of dependent adaptation that may be variously manifested by helplessness, trembling, or hysterical paralysis.

Consideration can now be given to the elements of the traumatic situation that influence behavior and thus the frequency both of acute fear reactions and of psychologic casualties.

INTENSITY AND DURATION OF TRAUMA

With the increasing magnitude of danger there is decreasing opportunity for appropriate action. Inability to cope with the threatening situation diminishes the probability that alertment will be translated into effective function and increases fear to the point of psychologic disruption and sequelae of undue apprehension. In traumatic situations of brief duration, favorable conditions are soon established for the resumption of effective behavior, whereas prolonged danger makes it increasingly difficult to maintain sustained, appropriate activity.

Another measure of the intensity of danger is the element of personal involvement, such as being knocked down by blast, buried in rubble, or injured by missiles. The greater psychologic trauma caused by intimate experience with danger has given rise to the concept of the "near miss" and the "remote miss."[14] Military and civilian stress situations are replete with examples indicating that the "near miss" is far more terrifying than the "remote miss," which in contrast seems to inculcate confidence that the

particular danger or threat can be successfully mastered. Often included in the "near miss" experience is the sight of mangled and mutilated bodies or other evidence of nearby destruction which is even more devastating when the deaths of loved ones, friends, and comrades are involved. Indeed, "near miss" events which do not include the observation of nearby casualities are much less traumatic and can more readily be tolerated.

TRAINING

From the standpoint of prevention, the most important single influence on behavior in atomic stress lies in training and preparation for such an eventuality. It has been pointed out that failure of an adequate response to sudden danger not only decreases chances for survival but evokes crippling fear reactions that render the exposed person vulnerable to psychologic breakdown. Clearly, a built-in behavioral pattern is required for effective adaptation in catastrophic trauma so that appropriate action can be more promptly initiated. Such training should include measures to be taken immediately on atomic attack, as well as evasive or defensive precautions to be employed during any warning period that may exist. Adequate preparation should also include a sufficient knowledge of the several primary effects of atomic weapons, the fallout problem, and practical field methods of personal protection. Equipped with this information the individual again deals with a predictable environment that, no matter how terrifying, is less fear-producing than unknown danger.

WARNING

Linked with training and preparation as potent determinants of behavior is the effect of warning prior to atomic attack. Even a brief warning period can enable prepared and disciplined groups to execute, at least partially, planned protective measures and to mobilize pre-set behavior for prompt action following the nuclear explosion. For untrained personnel, a short warning period before attack may well precipitate indecisive flight- or fear-induced paralysis of action, either of which is obviously deleterious to effective function or survival. Such unprepared groups necessarily require a relatively longer period of time to gain sufficient distance from the target area or absorb information regarding the best possible protection that can be employed under such circumstances.

COMMUNICATION

The transmission of information has come to play an increasingly vital role in the control of behavior, especially for groups under stress, such as in civilian disaster or military combat. Human beings are poorly endowed, insofar as sensory organs are

concerned, for the perception of danger unless their immediate surroundings have been radically altered. Significant minor or gradual changes are commonly overlooked or attributed to innocuous events in order to deny sources of anxiety that would disturb emotional equilibrium. To overcome these deficiencies in human perception, sensitive mechanical means of detection have been devised, but a communication network is needed to transmit the data thus obtained to all persons concerned. It should be apparent that much depends on the efficiency of the communication system to transmit accurate and timely information so that proper evaluation can be made and appropriate action taken.

Like perception, the evaluative component of the mental process is also commonly impaired under stressful conditions. Here too, communication can become of major importance in determining behavior by directing the specific action to be taken. Under such circumstances, experience has demonstrated that not only must the information be clear and specific but such messages must be frequently repeated to counteract the disorganizing effects of fear which, among its many inhibitory characteristics, interferes with the mind's capacity for retention or recall of the immediate past.

LEADERSHIP

The leader may be regarded as an essential link or agent of the communication system who interprets transmitted information together with data gathered directly from the environment and indicates to others the proper response or behavior to be followed. Because most persons under severe stress suffer a temporary impairment of their ability to maintain communication with the surroundings or within their own physical and mental organization, they seem to be out of contact with the environment or to exhibit a high degree of indecision and suggestibility. Under these conditions there is a need and often a demand for information and guidance, and leaders would arise even if they were not formally designated. In fact, such "emergent" leaders have been regularly observed in civil disasters[19] as well as in combat. It is probable that the more capable among the appointed leaders and those effective persons who respond spontaneously in the emergency situation have the ability to favorably use the facilitative reaction of alertness to initiate sustained appropriate activity and thus remain relatively free from the inhibitory effects of fear.

GROUP IDENTIFICATION

Observation and experience indicate that the attitudes and characteristics of the group involved in a traumatic situation can profoundly affect the individual behavior of its members. Persons are better able to tolerate fear when exposed to danger along with

others similarly concerned. In fact, persons confronted with a common menace literally move toward one another for possible mutual protection and emotional support. This phenomenon has been regularly noted in combat and was also reported from England during World War II where community shelters were preferred over individual types of protection despite the added personal discomfort.[4] From the standpoint of communication, members of the group serve each other as verbal and nonverbal sources of information that may initiate and maintain constructive behavior or enhance apprehension and cause noneffective activity. With continued sharing of common hardships and danger there is commonly evoked a cohesiveness of the group which in military experience has been demonstrated to be a powerful force for effective performance even under severe stress.

PREVENTION

From the above consideration of various elements in the traumatic situation which influence behavior, it is evident that any measures to lessen psychologic breakdown or other forms of noneffective activity under conditions of atomic warfare necessarily must lie within the realm of command and cannot be a primary medical function. In this respect the situation presents no essential difference from other programs of preventive medicine in the military service that also require implementation that can only be initiated and maintained by command decision. The medical officer serves as a technical adviser to the commander in matters of physical and mental health. As part of this staff duty the medical officer should be thoroughly familiar with the determinants of behavior under adverse circumstances in order to better assist the commander in conserving the effective strength.

TREATMENT

These disorders are acute, fluid, adaptive reactions to traumatic situations, are self-limited, and can be expected to improve with the cessation of danger. The persistence of such transient conditions after a reasonable period of time following removal of the causative situational trauma must be presumed to have some purposeful connection with the reality of the person's current environment In the past this often has been found to be the permissive and indulgent atmosphere of the very treatment regimen that was designed for his recovery.

The methods of treatment proposed are derived from the accumulated experiences with similar emotional disorders due to combat. Through trial and error efforts during World War I, World War II, and the Korean campaign[20] there have evolved successful and practical therapy technics which are based on the following operational principles.

Decentralization. This stresses the importance of the level or location where the treatment effort should be performed. Treatment facilities must be brought to the psychiatric casualty in the field instead of evacuation to a hospital facility. By a decentralized program, therapy would be made available as soon as possible and as near as practicable to the scene of the atomic attack. Benefits that can be expected from this policy include the following:

1. Treatment can be given early during the fluid stage when persons are more readily influenced to recover self-control by suggestion and other concrete measures, thus circumventing the emphasis on adaptive failure, made by time and continued helplessness, that produces chronic, undue apprehension.

2. Persons with psychiatric problems are prevented from entering evacuation and hospital facilities, which will be fully occupied by those physically injured.

3. Treatment at this level can promptly restore vitally needed, trained men who will be urgently required for defensive and rescue tasks.

Expectancy. This principle of therapy refers to the importance of verbal and nonverbal communication between patients and treatment personnel. It is based on the marked suggestibility and need for guidance exhibited by most persons who have been overwhelmed by external terror and are unable either to correctly perceive the outside world or adequately to make use of their perceptions for appropriate decisions. Military experience has demonstrated that whether persons with situationally induced, acute psychologic disorders worsen or improve depends on what is expected of them by persons responsible for their treatment and disposition. A treatment environment that communicates tension, helplessness, and disability prolongs symptoms and noneffective behavior. Conversely, calmly accepting the patient and regarding his manifestations as constituting a temporary incapacity, from which, after a brief rest, rapid recovery is expected, can produce improvement within hours, particularly when supervised or directed activity is promptly instituted as confirmation of these expectations. Attitudes and actions are far more effective than words in breaking through patients' barriers to communication. The mere verbal repetition of expectancy for recovery by treatment personnel who are not convinced that such psychologic disorders are self-limited and will improve is soon revealed to the patient for what it is by many nonverbal cues that indicate uncertainty or anxiety regarding the outcome.

Expectancy of recovery is also transmitted by the terms used to designate these disorders. In the past there has been an unfortunate spontaneous tendency to use descriptive and emotion-

ally charged terms, such as shell shock, psychoneurosis, and concussion, all of which convince the patient that he has suffered severe mental or physical damage from which recovery is uncertain and disabling residual defects common. Already the term radiation sickness is well known and could easily come into widespread use as a catchall for manifestations that do not fit a known physical disease. It is therefore imperative that such terms as combat fatigue be continued in atomic warfare, because their meaning indicates a transient benign disturbance due to logical situational conditions which leave no particular defect.

Simplified Methods. The requirements imposed by decentralization and expectancy render unrealistic any prolonged or involved treatment program. Such methods either could not be adequately performed at a decentralized level, or, if attempted, would nullify the principle of expectancy by the implication that the illness is serious enough to warrant such a major effort. In prior experience with complex treatment methods that rely on drugs, prolonged bed care, subshock insulin treatment, and frequent psychiatric interviews, only mediocre results were obtained despite the large outlay of personnel, time, and facilities. On the other hand, a brief rest of several hours, along with measures to relieve hunger, pain, or minor injury, when given at a decentralized level in an atmosphere of expectancy for recovery, provides the most favorable conditions for the restoration of impaired communication faculties and a resurgence to functional capacity. Drugs should be used sparingly, and preferably in small doses; relaxation can probably be as well obtained in most cases with warm drinks of cocoa, soup, and the like. If time permits, there should be included in this simplified program a brief interview during which the patient is encouraged to give his account of the traumatic event, not particularly for information purposes, but to facilitate the ventilation of his emotionally charged feelings and attitudes responsible for his withdrawal from painful reality. The ventilation of these emotional accompaniments of the traumatic experience often aids in re-establishing communication with the patient, who then can receive information and be motivated to participate in rescue and defensive efforts. The last step of this treatment method is supervised work. With resumption of purposeful activity and reorientation to group and social obligations, the ability to communicate further improves.

DISCUSSION

These treatment methods pose a pertinent question, namely: Who shall be responsible for the management of psychologic disorders due to atomic trauma? A sufficient number of psychiatrists will not be available, nor are they needed for the operation of a simplified treatment program. From the traditional military stand-

point, the control of noneffective behavior under battle conditions is necessarily the responsibility of all persons charged with the function of leadership and medical care. As in conventional combat, the milder instances of "freezing," indecision, helpless attitudes, or inappropriate activity can best be handled by comrades, medical aid men, and noncommissioned and commissioned officers who are already on the scene and whose words and actions can influence or direct temporarily disorganized persons to assume a more effective role. Those with more persistent psychologic abnormalities should be treated at the nearest functioning medical facility, which in a tactical situation would most likely be an aid station. If the nuclear explosion were in a rear zone, it is probable that a hospital facility in the area would provide the most immediate organized medical care. In either event, the prompt treatment and restoration to duty of psychiatric casualties should become the recognized task of the first medical organization that receives them.

In atomic warfare, the battalion surgeon must assume more and more the role of a frontline psychiatrist in order to conserve the effective strength of his unit at a time when every man is vitally needed. Medical evacuation under such conditions will be a difficult procedure at best and initially, at least, should be reserved for those with physical injuries. The Korean campaign demonstrated that the battalion surgeon who was in a superior position to use the principles of decentralization and expectancy treatment could and did function effectively in a psychiatric capacity. Persons with severe or persistent conditions can be sent to the division psychiatrist at the clearing station level when time and transportation permit. The division psychiatrist should continue to serve as a professional consultant, to indoctrinate division medical officers in their psychiatric role, and to pay particular attention to his staff function as adviser to his commander on ways and means of preventing psychologic disorders.

In a hospital that becomes a frontline medical unit due to an atomic attack in its vicinity, it is recommended that a psychiatric and welfare section be established that would operate with a minimum of supplies and personnel and be located adjacent to the facilities for the physically injured. Such a function could be performed by Medical Service Corps officers trained in psychology or social work, Red Cross personnel, chaplains, and several enlisted technicians, along with a nurse to care for minor injuries. The assigned psychiatrists should serve only as consultants to this section during the emergency period, for as medical officers their services are more urgently required in the care of the physically injured.

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SUMMARY

Based on past military and civilian experiences of behavior under catastrophic trauma, the following assumptions and recommendations have been made regarding psychologic problems in atomic warfare.

The common psychologic abnormalities to be expected in atomic warfare are states of temporary mental disruption and their sequela of increased apprehensiveness.

Major determinants of behavior under conditions of atomic attack include the intensity and duration of the traumatic agent, training and preparation, efficiency of communication, leadership, and group unity.

Prevention of psychologic disorders in atomic warfare is a responsibility of command, with the medical officer serving in an advisory staff capacity.

Effective treatment of psychiatric casualties under conditions of atomic attack should be based on principles that include a decentralized or peripheral level of operation, expectancy for recovery, and brief simplified methods.

Treatment of psychiatric patients should be performed at the first medical facility to receive them so that rapid restoration to duty is accomplished. Battalion surgeons must necessarily function as frontline psychiatrists.

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CITIZENS OF THE WORLD

"In our culture, from Newton to Einstein, science has always been an international enterprise. The giants upon whose shoulders the giant Newton stood were a German, Kepler; a Pole, Copernicus; and an Italian, Galileo. So our modern understanding of the nature of matter is the collaborative triumph of the French, Lavoisier, Pierre and Marie Curie, and de Broglie; the British, Dalton, Thomson, and Rutherford; the Russian, Mendeleyev; the Italian, Enrico Fermi; the Dane, Niels Bohr; the Germans, Einstein, Planck, and Heisenberg; the Americans, Gibbs, Michelson, and Millikan. This is why men of different nations, so often in the history of science, have made the same discovery simultaneously. Such coincidence is almost inevitable in the case of great discoveries. Within the same half-decade, Newton and Leibniz fashioned the powerful instrument of the calculus. Joseph Henry, an obscure schoolteacher in Troy, New York, anticipated almost every one of the basic experiments that won Michael Faraday his fame as the founder of electrical technology."

—GERARD PIEL
in *Bulletin of the Atomic Scientists*
p. 239, Sept. 1955

A PSYCHIATRIC SERVICE AS A THERAPEUTIC COMMUNITY

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OUR military services may be likened to a large patriarchal family that leads a somewhat rigid and lonely existence, whose fundamental mission is terrifying in wartime, and which in peacetime still lives in expectation of and preparedness for destruction. Its members, for the most part, are siblings involuntarily, as in any other family unit, and the stresses of their unique communal existence create a number of psychiatric casualties. The psychiatrist called upon to manage these men during their initial psychiatric hospitalization deals with a special part of social psychiatry.

The psychiatrist in the military services has the somewhat anomalous mission of either helping his patients to accept an autocratic family or separating them from the service, not as successfully emancipated but as unsuccessfully incorporated—that is, as failures.

Given, then, a group of men who for emotional, mental, or personality reasons are considered unable to function in the fleet or ashore, what social structure in a military hospital would be most conducive to help them accept their status as patients and to help them control their often impulsive or aggressive behavior? This article reports the methods employed in a naval therapeutic community, whose goal was socialization, self-control, whatever therapy was possible to give, and enculturation in a mental hospital.

The psychiatric admission ward of this hospital has been operated as a therapeutic community for a period of four months. The concept of the hospital as a therapeutic community in which all time spent in hospital is considered therapy, while not new, was given great impetus during the last war. The community is like the family, and the emphasis is upon the interpersonal relationships not only of the patients but also of the staff. With certain modifications, this unit is modeled after suggestions and ideas I obtained during a recent visit to Dr. Maxwell Jones' Social

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Presented before the Society of Neurology and Psychiatry at Honolulu, Hawaii, on 16 November 1955.

Rehabilitation Unit,[1–4] Dr. T. P. Rees' Warlingham Park Hospital, and Dr. T. F. Main's Cassell Hospital,[5] all in England. While group therapy is an integral part of the program, it cannot be emphasized too much that it is not group therapy but the therapeutic community which is the basis of the program's communal existence as conceived and operated.

A 35-bed receiving ward in a 350-bed psychiatric service receiving over 1,000 admissions a year constituted a serious management problem which in the past seemed to necessitate the constant use of seclusion rooms and oral and parenteral sedation. Almost constantly patients could be heard beating on the "quiet room" doors, yelling, demanding, and behaving in altogether outrageous fashion, and on the ward there were frequent incidents—fights and altercations during which it was necessary to "isolate" patients.

The therapeutic community poses this question: Would it not be possible—if the staff *expected* patients to control their own aggressive impulses, and if the staff's and patients' anxieties and interpersonal relationships were under constant scrutiny and study—for the patients to behave as human beings are "supposed" to behave together? Would we not then have an additional force in our favor, in that we were dealing with a group of men accustomed to order and obedience, or at least who were a part of an orderly organization? If our emphasis were upon their *controlling themselves* rather than our controlling them, would it not be possible totally to eliminate the use of seclusion rooms and all but do away with sedation? When these questions were presented to the staff, they said: "But what will we do when patients become violent?" "But they won't," was the answer, which was the answer given me by Dr. Rees in England when I asked him this question. His reply was based on 20 years of experience. In short, the ward was to become the "patient's world" and not the "doctor's domain."

In four months of operation of the therapeutic community, 285 patients have passed through the ward, and not one patient has been placed in the seclusion rooms by the staff.* No patient was given intravenous or intramuscular sedation, and not more than three dozen sleeping pills have been dispensed. No physical restraint has been used; no continuous baths, no camisoles, no cold wet packs have been prescribed.

Many of these patients were suicidal, homicidal, psychotic, previously violent and assaultive, and confined in seclusion

*Three patients were placed in seclusion rooms during the night by Officers of the Day early in the operation of the receiving ward. They were kept in the seclusion rooms less than one hour.

rooms in other hospitals. Many arrived in restraints or strait jackets, and many prisoners were accompanied by armed guards. All patients were accepted in this ward, for there was no other ward and no other hospital to which they might be sent. The average stay on the ward was 10 days, after which time they were sent to a locked or open ward, depending upon their clinical condition. None was sent out earlier because of unmanageable behavior. The average daily census was 19 patients, with a range from 14 to 34. This is a special hospital situation dealing with a special patient population, a constantly changing group with an average per working day of three new patients arriving and three leaving.

Nonrestraint is nothing new. The Quaker retreat founded by William Tuke in 1794 at York, England, was the first asylum attempt at humane treatment of the insane, before Philippe Pinel, with the consent of the French National Assembly, on 24 May 1798, struck off the chains from 49 insane patients at Bicêtre. John Conolly in 1838 became physician in chief at Hanwell Asylum in England, and introduced the term "nonrestraint." Tuke wrote that the best form of restraint is self-restraint, and Conolly wrote that "after five years' experience, I have no hesitation in recording my opinion that . . . there is no asylum in the world in which all mechanical restraint may not be abolished, not only with perfect safety but with incalculable advantage." While everyone could see the advantages of eliminating chains, leather straps were often substituted for them, and there is still a tendency to substitute solitary confinement for these.

According to Zilboorg,[6] the question of nonrestraint was heatedly debated everywhere, and the humane and practical considerations clashed sharply. In the United States, the discussion of nonrestraint was so stormy that at one meeting of the Association of Medical Superintendents, Isaac Ray arose to express the opinion that nonrestraint might work with Europeans who, sane or insane, were accustomed to obey orders, but not with Americans who believe in liberty, and who unless restrained assert themselves even in a state of insanity.

When one does not have recourse to restraint or seclusion, there is greater demand upon the staff for attention to individual human needs and a call for greater ingenuity and resiliency in dealing with irrational or distressed people. Not only is there need for more attention to the supervision and management of patients, but also for the training and supervision of staff personnel.[7]

PATIENT SAMPLE

Patients were selected only in that they were all men previously screened for military service. A total of 250 consecutive cases

was analyzed in regard to certain social and medical features. The average age was 24.3 years, and 91.1 per cent were Caucasians. Two thirds of the remainder were Negroes. The average total length of previous military service was 4.7 years, and 18 patients had had less than six months' service. There were 172 naval personnel (75 per cent) and 78 Marine Corps personnel. There were nine naval officers (5.3 per cent) but no Marine Corps officers; but on the other hand, there were 14 Marine Corps sergeants (18 per cent) compared to 15 Navy Chief Petty Officers (8.8 per cent) suggesting that the psychiatric casualty risk was perhaps greater among enlisted marines who became noncommissioned officers. On the other hand, the risk among naval officers seemed to be greater than among Marine Corps officers, which may be related to the fact that naval officers may be drafted, while Marine Corps officers are volunteers. But there were no significant differences between rated and nonrated enlisted marines or sailors, though one may be drafted and the others were all volunteers (table 1).

TABLE 1. *Distribution of 250 consecutive psychiatric patients by rank*

Naval personnel			Marine Corps personnel		
Rank	Number	Per cent	Rank	Number	Per cent
Nonrated	93	54.0	Private	32	41.0
Rated	55	31.9	Private First Class	24	30.8
Chief	15	8.8	Corporal	8	10.2
Officers	9	5.3	Sergeant	14	18.0
			Officers	0	0
Total	172	100.0		78	100.0

The duty station where they were admitted to the sick list was aboard ship in 32.4 per cent and ashore in the United States in 46 per cent, while 21.6 per cent came from shore stations beyond the continental limits (table 2).

Diagnostic Categories. The most common diagnoses were psychoses (44.4 per cent), the second was neuroses (35.6 per cent), and the last, personality disorders (20.0 per cent) (table 3). All of these patients formed the mixed ward composition, so that the very sick were mixed with the less sick, including patients with psychosomatic disorders referred from medical wards as unsuitable for military service because of such disorders as

TABLE 2. *Type of duty station from which 250 consecutive psychiatric patients were admitted*

Station	Number	Per cent
Ship*	81	32.4
Shore	115	46.0
Beyond continental limits**	54	21.6
Total	250	100.0

*60 per cent from small ships; 29.3 per cent from carriers; 10.3 per cent from large ships.
**Japan (including Korea), 15; Hawaii, 5; Alaska, 4; Okinawa, 2; Philippines, 2; Tinian, 1; Midway, 1; Guam, 1.

TABLE 3. *Diagnostic classification of 250 consecutive psychiatric patients*

Diagnostic category	Number	Per cent
Psychoses	111	44.4
Psychoneuroses	89	35.6
Personality disorders	50	20.0
Total	250	100.0

bed-wetting and sleepwalking. The mixture of these patients was by no means a disadvantage and rarely a problem. The specific diagnostic categories of the patients are shown in table 4. It will be noted that the most frequent personality disorders were passive-dependency reactions and passive-aggressive reactions, and among the neuroses the most common diagnoses were neurotic depressive reaction and anxiety reaction. Paranoid schizophrenic reaction and mixed schizophrenic reaction accounted for 72.1 per cent of the psychotic patients.

Alcoholism was a feature in 14 per cent of the patients, and over half of these were in disciplinary status. Alcoholism accounts for about 10 per cent of mental hospital admissions in nonmilitary hospitals. A slightly smaller per cent of patients gave a history of alcoholism in the father; two thirds of these patients were themselves alcoholic. Over 25 per cent of the total patient sample were awaiting court-martial or had had courts-martial in their service career. All patients admitted to the naval brig passed through this ward, but remained on the ward only if there was a concurrent psychiatric diagnosis.

TABLE 4. *Diagnoses in 250 consecutive psychiatric patients*

Diagnosis	Number	Per cent
Personality disorders		
Passive dependency reaction	17	34.0
Passive aggressive reaction*	13	26.0
Emotional instability reaction	7	14.0
Immaturity reaction	6	12.0
Schizoid personality	5	10.0
Inadequate personality	1	2.0
Asocial personality	1	2.0
Total	50	100.0
Psychoneuroses		
Neurotic depressive reaction	35	39.4
Anxiety reaction	32	35.9
Conversion reaction**	14	15.8
Chronic alcoholism	3	3.4
Phobic reaction	2	2 2
Obsessive compulsive	1	1.1
Acute situational maladjustment	1	1.1
Sexual deviate	1	1.1
Total	89	100.0
Psychoses		
Schizophrenic reaction		
Paranoid	39	35.2
Not elsewhere classified	42	37.8
Latent	6	5.4
Catatonic	4	3.6
Simple	3	2.7
Hebephrenic	2	1.8
Other		
With demonstrable organic disease	7	6.3
Delirium tremens	5	4.5
Manic depressive	3	2.7
Total	111	100.0

*1 of narcotic addiction.
**4 of psychogenic gastrointestinal disorders.

Since the ward is thought of in terms of the family unit and the patients are considered as social casualties from the large service family, it is important to consider the number of patients who come from broken homes. A broken family is one disrupted by divorce, separation, or death of one or both parents. In the United

States, broken families constitute one ninth of all families, and death is by far the chief cause of family disruption (over 50 per cent). In our patient sample there were 40.8 per cent from broken homes, and death accounted for 41.2 per cent of these. The incidence of broken homes was four times as great in psychiatric admissions as compared with the general population (tables 5 and 6).

TABLE 5. *Incidence of broken homes in 250 consecutive psychiatric patients before the age of 15*

Event	Times occurring	Per cent of patients	Average age of patient at event (yrs)
Death of father	24	9.6	8.3
Death of mother	18	7.2	5.4
Total deaths of either or both parents	42	16.8	7.0
Divorce or separation	60	24.0	5.5
Total deaths and divorce/separation	102	40.8	7.6

TABLE 6. *Incidence of crimes of violence or psychosis in parents of 250 consecutive psychiatric patients*

Event	Times occurring	Total	Per cent of patients
Crimes of violence			
Father raped patient's sister	2		
Father murdered mother	2		
Father sentenced for murder of other than mother	1		
Father executed for murder	1	6	2.4
Psychosis			
In mother	5		
In father	2	7	2.8
Total		13	5.2

WARD ROUTINES

The ward is a locked temporary structure from which no patient is permitted to leave unattended at any time. There is an en-

closed adjoining courtyard. Ward meetings are held daily from 0845 to 0930 hours Monday through Friday. It was believed that with daily meetings, it would be unlikely that many ward tensions could build up to a point where they would spill over into the "acting" area rather than the "talking" area. All the patients on the ward attended all the meetings. Each patient was seen within an hour of admission by the ward medical officer, and was told of the ward meetings and that he was "expected" to attend. When a patient was admitted after working hours, he was seen by the officer of the day. There have been only three patients who have constituted a matter of group concern because of their wish not to attend the meeting, but each remained in the group, sitting at the edge.

Any topic of discussion is permitted, and the emphasis has almost invariably been focused on the "here and now." Only in the initial groups, before a ward culture[8] existed, was there any prolonged discussion about "practical matters" such as ward lights being too bright at night, cigarettes, the medico-legal matters of their service disability, coffee, food, et cetera. There is a constantly changing complexion of the group, usually stimulated by the more articulate neurotic patients, especially those with considerable anxiety, by the aggressive, disturbed, delusional psychotics, and by the angry "psychopaths." Silence is not uncommon. One group was totally silent for an entire session, and frequently the initial silence may vary from a few minutes to 15 minutes.

All nurses, corpsmen, and doctors are present at all groups, with the exception of one needed in the front office and for occasional ward routines. The presence of female nurses adds a measure of decorum, and the patients are quite ruthless with any member, psychotic or not, who uses profanity. As a matter of fact, "acceptable behavior" and conduct is a frequent topic. Three patients, all psychotic, have struck other patients or have been struck. One was under the delusion that all the ward thought he had stolen $70,000 from an aircraft carrier (his superior officer had been missing simultaneously with the ship's loss of this sum, just prior to the patient's psychotic break). Although the patients were afraid of such a sick, irrational, violent person, the episode lasted only two days. The group responded to this patient with incredulous reality comments. The following day the paranoid patient began the hour by saying he thought everyone in the room was a relative or close friend (his current delusion), and he never struck a patient in the ward thereafter.

The ward is not a disturbed ward, but only a potentially disturbed ward. The group meetings seem like any group of sailors in a "bull session" *except* that there is a remarkable degree of

sophistication and almost total lack of profanity. Often the patients say penetrating, gentle, or even brilliant things to help each other, things that any psychiatrist might wish he had said. Left to their own devices, treated with genuine consideration and seriousness, with a real desire by the staff to help, they speak like seasoned therapists, prefacing their comments with such phrases as "could it be that you believe . . . " or "I wonder if you are bothered by . . . " or "what do you mean by the word 'gentleman' . . . " or "yesterday you said . . . " or "why do you feel as if . . . ."

Occasionally the corpsmen or nurses speak in the group, and not infrequently the "leader" says very little except to give a summary of the hour in the last one to five minutes.

After each group meeting, the staff has a half-hour meeting in the doctor's office, during which time the group behavior and comments are analyzed. Particular attention is focused on who said what first, who said what to whom and why, and what changes are observed in the sicker patients. The leader is immeasurably helped by so many observers, and once a very young corpsman said to the doctor, "Why were you anxious when . . . ." It was my first awareness of the point, which was well taken.

The more bizarre the psychotic patient, particularly in the more manic or hebephrenic categories, the more the group seems to deny his "insanity" and consider him a malingerer. The more fearful, hallucinating, or suspicious are literally nursed and doctored by many patients. The daily groups have been found to keep a group feeling in operation, and paring and splintering off is kept to a minimum, though it is to be remembered that the patients are in this ward only a short time. In the staff meeting, because of the constant feedback of communication in the whole psychiatric hospital, we are kept informed on how patients who have left the unit are getting along on other wards.

From the very start, the staff has made careful observations of where the patients place their chairs. The ward is long and narrow and the leader always sits in the same chair. Others bring their chairs and sit in varying group configurations. It has been invariably observed that the greater the ward tension, the more they congregate at the north end of the ward, where the exit door is located. This has come to be known as the "fire escape maneuver." When a very disturbed psychotic patient is present, all patients may sit at the north end of the ward. It is possible to guess the role a patient will take in a meeting if he occupies a certain chair. In our particular ward culture, we now know that there is a "speaker of the house" chair, located prominently and usually alone, either at the north or south end of the group, and

a "guest of honor" chair directly across from the leader's; the latter is usually occupied only for one or two sessions by the same person. It is also an "oppositional" chair, which is probably why it is occupied for such brief times. In subsequent meetings, the occupant then moves nearer the leader or far back into the group. The most aggressive "psychopaths" sit in the "sulking" chair (sometimes called the "coroner's" chair) at the far north or south edge of the group, on the same side of the room as the leader. There is also a "preacher's" chair, the "right-hand" chair (of the leader), and the "deputy leader's" chair (on the left side). The older naval "chief's" chair is to the side, and clusters tend to gather by the door to the courtyard.

The group moves closer to the leader when they are more "friendly" or comfortable, and farther from him when they are angry at his ineffectualness in calming or punishing an aggressive "antigroup" psychotic patient. But always they seem to move as a group, clustering, pulling away, pulling toward the verbal members and the leader, depending on how they feel toward these individuals at a particular time. Seating is never interpreted in the ward meeting. Individual behavior is that which is group-acceptable. It is apparent to all when patients speak insincerely, are very guarded, or are trying to be "good group members," and their contributions usually lead to silence from the other members. When a patient is deeply moved by what he is saying, or telling the group about a very emotionally charged situation, he will almost invariably be joined by others who want to know more, tell their own stories which bear close relationship, or actively help him with his feelings.

On occasion, when the group is struggling with important material and is unable to put it clearly into words, the leader employs any one of a series of 16 short, recorded dialogues dealing with parent-child conflicts, illustrating a point at issue such as "revenge," "neurotic demands," "regression," "aggression," et cetera.[9] These were especially prepared for group meetings.* They are played only on the clues from topics presently meaningful after the group has been going for 20 minutes or so. They are unfinished stories which the group completes. Other sound stimuli are 21 brief and more vague sounds,[10,11] such as the sound of an angry father, without any clue as to why he is angry, et cetra.** These records have proved of great value if chosen appropriately to the point at issue and played at the proper moment, just as an interpretation, properly timed, is made

*The text of these records have been published,[9] and the records are available for research work by others.

**These records I have described previously as constituting a sound association technic,[10,11] and they are available for research work by others.

about what is being discussed and what it related to at one time. They have been of even greater value when played to staff meetings for analysis of what was said or done and of why and how.[12, 13]

In addition to the full staff meeting immediately after the group meetings, there is an hour meeting once a week with the ward corpsmen and once a week with all the nurses in the psychiatric wards who wish to come. The sincere desire of the nursing and corpsmen staff to treat people with human dignity is both moving and rewarding.

The staff of the receiving ward includes a medical ward officer (myself), nurses, corpsmen, a clinical psychologist, a psychiatric social worker, and occasionally an intern or resident. When there are visitors to the group, which is not encouraged, their effect on the group is always scrutinized with considerable interest.

Certain reality limitations imposed by the nature of the ward and the military service make this a special sort of therapeutic community. Here the process of acculturation becomes a group process and patients become a part of a mental hospital prior to transfer to other wards. We are dealing with a *given patient population.* The patients who have been there longest move out first. We also are dealing with a *given staff,* there being no selection of members beyond that of the routine processes of transfer and assignment. We have made no effort to select our nurses or corpsmen, but do make intensive efforts to train them as a vital part of our team.

In general it can be said that the formal therapy of the patients begins at the group meeting and ends with the conclusion of the staff meeting, a total of 1 hour and 15 minutes a day for 14 to 34 patients. The routine work of the ward includes an admission interview with each patient, lasting an average of 45 minutes, and all the tasks of an active receiving ward such as telephone and personal interview with relatives, transfer to other wards, and such interviews with individual patients as are requested by the patient or considered important by the ward medical officer. One patient is always carried in continuous daily therapy by the leader, to give him further insight into the group dynamics.

On the bulletin board in the ward is posted a piece of paper on which any patient who wishes to see the doctor individually may write his name. Patients are seen in strict sequence in which their names appear, and usually within 24 hours each name is conspicuously checked. In this way everyone on the ward knows who sees the doctor and how often, and no verbal promises are made which might be forgotten. The content of these request interviews generally involves personal matters that are not

appropriate for group discussion, individual service problems, and questions of when a man will leave the ward and if he is going to an open or closed ward. There is no question but that the patients are apprehensive about being sent to a locked ward, and many patients remain silent in the groups for fear they will say the wrong thing and be sent to a closed ward. But they do not hesitate to talk about the staff if they wish, and the only patient who was "threatened" by a corpsman started talking about it the very second the hour began. Names are used, and if patients are reluctant to use names either of patients or of staff members, it is always a topic for leader interpretation; this almost invariably results in names being used.

QUIET ROOM

The "quiet rooms" are not necessary to control patients who, given a chance, will control themselves. Patients will control themselves within the limits of which they are capable, if the staff's attitude is that they are capable of self-control. Patients who in their previous hospital stay have torn pillow cases, urinated on the floor, or assaulted corpsmen, simply behave in an acceptable fashion when subjected to the socializing pressure of the patient group. Moreover, seclusion is almost always considered to be "punitive," and the almost universal expressions of "being thrown into the quiet room," "placed in quiet room without force," or "placed in quiet room with force" are self-revealing.

Patients admitted to the receiving ward have many of their possessions "confiscated": matches, lighters, often glasses, clothes, et cetera. To confiscate their freedom by solitary confinement is a fearful experience. It has been observed that many of the patients previously placed in seclusion rooms were troubled by claustrophobia and suffered terribly. Others who are existing with the frightening belief that they are about to lose control of themselves and do all sorts of incredible things have their fears confirmed by this action; it is as though the staff acknowledges this fear as reality-based and says, in effect: You *are* in danger of losing control! How much more reassuring to say, by actions: You won't lose control, and the patients will help you control yourself. Furthermore, when they are locked up in "cells" delusional patients often experience an intense activation of their irrational fears, and their voices tell them all sorts of bizarre things. Calling seclusion rooms "quiet rooms" is a strange euphemism; to be truthful, we should call them "noisy rooms" and the wards "quiet wards." If seclusion rooms are not used, the staff must be tolerant of an occasionally noisy and tense ward, in the belief that it can best be handled in communal living.

Some patients locked or placed in quiet rooms feel they have been sent into the corner, locked in the closet, ostracized. Some patients come to us *asking for the quiet room,* which is always refused. A patient's request for the quiet room may be a symptom of the wish to withdraw, when what he most needs is help in belonging. Others request this out of a fear they will be placed in the quiet room and they wish to "beat the staff to the punch" to show that *they,* not the staff, are in control of this business. Often acquiescence in this neurotic or manipulative retreat is not just fostering acting out, but actually participating in it.

It is vitally important to realize that patients will often feel they have a license "to act crazy" because they are on a psychiatric ward; the less sick will exploit any chance to retaliate in their resentment of their confinement, and the more sick may use the "acting crazy" as reassurance that their "insanity" is under their own control, *i. e.,* they can turn it off and on as they wish. They can use the quiet room in a masochistic way by confirming their avowed belief they are in the "nut house." But people cannot "belong" unless they are with people, unless they can see they will be accepted however they are, though their fears tell them otherwise. And to some patients, not belonging is not being, and not being is nonexistence or death or fostering of autistic life. What they need most of all is to judge, test, and live in reality relationships with other people.

Many extremely provocative patients come to our unit, literally and figuratively asking for punishment. This is particularly true of psychopaths who have had prison or brig experiences, and of paranoid schizophrenics who have been in "quiet rooms" and constantly or intermittently given sedatives. Such patients seem at first to be utterly bewildered by their treatment in our unit. Coming into a new hospital, they cannot believe it when the nurses or corpsmen refuse to be provoked, or at least outwardly punitive. Once in a while it appears to me that some of the corpsmen and an occasional nurse are tempted, but still the pressures of their group seem to be successful in preventing them from yielding to these impulses.

One day I came to the ward and heard a piano. Upon investigating, I found that the mattress had been moved from the floor of a quiet room and a piano had been placed there. The only other quiet room on the ward has been converted into an office.

SEDATION

Patients transferred from one service psychiatric hospital to another are almost always given a sedative prior to transfer and frequently en route. The routine administration of sedation prior to transfer seems not only unnecessary but also unwise. Many of

these patients are quite confused and their sensorium is further clouded by drugs, so things which should be clear are vague and shadowy. On the receiving ward, new patients will frequently ask for sleeping medication. Many state they have had nightly medication and cannot sleep without drugs. Each such patient is interviewed alone, and it is explained that people become dependent on drugs and we only prescribe sleeping pills under unusual circumstances. Very few patients have ever asked again. They seem to have a bad night or two and then sleep. They seem quite thankful to be free of the drugs.

It is a much more difficult task to refuse sleeping pills than to give them. For one thing, an explanation is necessary; furthermore, anxious patients can produce considerable anxiety in their doctors and nurses. The professional staff then responds by anesthetizing the patient whose anxiety *they* cannot tolerate. Sleeping pills seem to be given to a great many hospitalized patients because the staff is more concerned about *their* sleep and anxiety than the patients'. When insomnia becomes a matter of concern for several patients, the group may devote almost all their time discussing the causes of insomnia, and after such sessions it has been our experience that the insomnia and restlessness in the night disappears from the ward. Thorazine (brand of chlorpromazine hydrochloride) or Serpasil (brand of reserpine) has been given to only eight per cent of the patients.

The manifest and latent content of the group discussions, their continuity from day to day and their recurrent themes, and the group dynamics of this particular type of constantly changing group will be the subjects of a subsequent communication.

While there are intriguing dynamic factors which are constantly observed and interpreted to the staff in psychoanalytic terms, there are features about the therapeutic community which can also be understood in terms of the physical analogy of mechanical adaptation. Thompson[14] wrote that "there is a certain principle, much to the fore in the construction of the skeleton, well known to the designer of a hydroplane or 'flying boat,' and not wholly neglected by the bridge-building engineer; it is the principle of nonrigid, flexible, or *elastic stability*. (India rubber has great elastic stability, though it is not compressible.) A homely comparison between a basket and a tin can can tell us in a moment what it means, and shows us some at least of its peculiar advantages. This method of construction helps to *distribute* the load, bridges over points or areas where pressure might be unduly concentrated or confined, adapts itself to a sudden impact or concentrated stress, helps to lessen or guard against *shock,* and imparts to the whole structure a quality which we may call,

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for short, *resiliency* . . . . We see a tendency for material to be laid down in the skeleton in the lines of *stress* and so to evade thereby the distortions and disruptions due to *shear*. In these phenomena there lies a definite law of growth, whatever its ultimate expression or explanation may be. Let us not press either argument or hypothesis too far."

SUMMARY

A 35-bed receiving psychiatric service in a 350-bed psychiatric naval hospital has been operated as a therapeutic community for a period of four months, during which time 285 patients were in residence for an average period of 10 days each. Almost half of these patients were acutely psychotic and in their first breakdown. With the constantly changing population in this ward, daily meetings of all patients were held on the ward, followed by staff meetings.

The efforts to foster acculturation of the patients by the patients with staff help and encouragement have made it possible totally to eliminate the use of the quiet room and parenteral sedation, and greatly to diminish the amount of oral sedation. Eight per cent of the patients received Thorazine or Serpasil.

By daily working with the patients and the staff, so that each 24-hour period was constantly scrutinized as therapy, a previously disturbed ward was changed to a potentially disturbed ward.

This communication emphasizes the socialization and changes in human behavior resulting from simple, humane care of patients, which has from earliest times characterized the proper care of the sick.

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OPERATION "CHEST DISEASE"

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DURING 1954 the U. S. Navy successfully examined 1,543,644 persons by means of 70-millimeter photofluorographic chest x-rays. Of these, 1,717 were disqualified for possible tuberculous lesions and 2,336 for other chest conditions of a nontuberculous nature. Thus, 4,053 persons, or about 1 out of every 400 examined, were either hospitalized for clinical study or referred to chest clinics for further evaluation.

The tuberculosis control program of the U. S. Navy, as it exists today, was initiated in 1941 and consists primarily of the following three basic study programs: (1) routine chest roentgenographic examinations of both military and civilian personnel upon their entering service, upon their discharge from service, and at annual intervals when practicable; (2) routine tuberculin skin testing of all Navy and Marine Corps recruits; plus special intensive studies of medical and dental personnel on duty in U. S. naval hospitals within the continental limits, because medical and dental personnel have an incidence rate for tuberculosis approximately double that for the U. S. Navy as a whole;[1] and (3) the isolation, study, and treatment in U. S. naval hospitals of personnel suspected of having chest disease, with emphasis on transfer of such patients to the pulmonary diagnostic and treatment centers at the U. S. Naval Hospital, St. Albans, Long Island, N. Y.; and the U. S. Naval Hospital, San Diego, Calif.

The purpose of this article is twofold: (1) to outline the work of the Preventive Medicine Division of the Navy Bureau of Medicine and Surgery in administering case-finding procedures in the tuberculosis control program; and (2) to present the data on successful examinations and suspected disease obtained in 1954 by means of 70-mm photofluorographic films.

There are 103 photofluorographic units throughout the United States and overseas where roentgenographic examinations of the chest are made by the Navy. Eleven of these units are mounted on buses and two are transportable. For economy, convenience, and speed, almost all stations use photofluorographic equipment for taking survey 70-mm films. An immediate interpretation of

From Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C.

the film is made at the various stations, and 14- by 17-inch celluloid films are ordered for those individuals whose 70-mm films reveal suspicious findings. If the suspicious area is verified by the 14- by 17-inch film, the serviceman is sent to a naval hospital for consultation or admission as appropriate.

In the case of civilian personnel employed by the Navy, those who are found to have suspicious 70-mm films, confirmed by 14- by 17-inch films, are referred to their private physician or local medical facility for clinical evaluation. They may not return to work until acceptable proof has been furnished of a clinical examination showing that no disease in a communicable state is present. Their jobs are retained for them while they are on sick leave, however, if so desired.

Each month all 70-mm films that have been taken are mailed to the Tuberculosis Control Section of the Bureau of Medicine and Surgery of the Department of the Navy in Washington, D. C. The films are accompanied by a log that gives pertinent identification and information, as well as the interpretation of each film by the roentgenologist. The 14- by 17-inch films taken because of suspected pathologic conditions are kept at the station, but copies of the reports on these films are forwarded to the Bureau.

The advisability of second readings of 70-mm films has been established by Yerushalmy,[2] Groth-Petersen, Løvgreen, and Thillemann,[3] and others. The Navy has practiced this dual reading for the past 10 years. A course of instruction in the interpretation of photofluorographic films is offered by the U. S. Naval Medical School, Bethesda, Md., for qualified officers of the Medical Corps who express an interest in this subject. The officer is trained for about three months, and during his training period will review under supervision the films and interpretations submitted by the 103 activities taking the films. This serves the dual purposes of enabling the Preventive Medicine Division to review and re-evaluate the films taken in the field, and of training medical officers in the interpretation of chest x-rays so that superior and more uniform reading of films will be made at the various activities throughout the Navy where roentgenologists are not available.

If a 70-mm film that was not interpreted in the field as abnormal is found in the course of re-reading to be suspicious, the Tuberculosis Control Section sends a letter to the commanding officer of the activity at which the film was taken, requesting that the subject be recalled for a 14- by 17-inch celluloid film. A copy of the report of the repeat examination is mailed as soon as possible to the Bureau of Medicine and Surgery, and is filed for reference. At the completion of the second reading, the 70-mm films are packed, marked, and mailed to the U. S. Naval Records Management Center, Garden City, Long Island, N. Y., where they are stored for future reference.

Ideally, it would be desirable to maintain a central file of follow-up findings on each suspicious photofluorogram, including a record of the final disposition of the subject. Practically, this has not been feasible, but service personnel have entries made in their medical records of the x-ray findings and consultations, so that at the local level the complete story is available to the physician holding the medical record. The large number of civilians with suspicious findings on photofluorograms are referred to family physicians or public health chest clinics for follow-up. Administratively, it would be extremely difficult and time consuming to attempt to obtain the results of their studies in each individual case. For these reasons the only data available concerns the total number of suspicious films found in a given year, and it is not possible to report final data on the number and nature of pathologic findings discovered as a result of photofluorographic examinations.

RESULTS OF STUDIES

Bircher and Castle,[4] in their study of 348,875 persons examined over a four-month period by the Navy, were able to adequately evaluate 659 of 773 people referred to the hospital for possible chest conditions. Of 659 patients, 284 were *not* admitted to hospitals and 86 were admitted for unrelated pathologic conditions. This left only 289 people (43.9 per cent) with 293 established diagnoses compatible with the original suspicious findings on photofluorographic examinations. They found that 9.6 per cent of the original 659 patients who had been referred for clinical study had active tuberculosis. They then estimated that one case of active tuberculosis will be found for every 5,538 photofluorograms.

Based on the conclusion that it is relatively impossible to make an exhaustive follow-up study at this Bureau, a correlative pilot study has been undertaken and will be reported upon its completion. It involves a continuing survey of proven cases of pulmonary tuberculosis at the two pulmonary disease centers of the U. S. Navy, with determination of the reason these patients were hospitalized. By this method, it is anticipated that the number of persons with active pulmonary tuberculosis admitted to naval hospitals as a direct result of the periodic x-ray program can be determined more precisely.

For statistical purposes, the individuals examined during the year 1954 are divided into four categories: (1) service—Navy and Marine Corps personnel on active duty or retired, and members of Naval Reserve Officers Training Corps and reserve units; (2) civilian—employees of the U. S. Navy, Federal Bureau of Investigation, Veterans Aid Benefit, and Bureau of Employees Compensation; (3) dependents—only dependents of Marine Corps and Navy personnel; and (4) others—Army and Air Force military personnel, and their dependents; also foreign military personnel.

Table 1 gives the breakdown according to the above grouping of persons examined and suspicious films found. It should be noted that in the survey of 1,543,644 individuals a second 70-mm photofluorogram was taken in 33,871 cases, because the first film was found to be technically unsatisfactory for reading and had to be discarded.

Of the 1,543,644 persons examined by satisfactory 70-mm photofluorograms, 38,007 (2.5 per cent) were initially suspected of showing possible lesions and were recalled for 14- by 17-inch celluloid films. On reading the 38,007 large films, confirmatory evidence was found in 4,053 cases (10.7 per cent). These patients were hospitalized for clinical investigation.

The 1,878 military personnel referred for clinical evaluation represented only 1.7 per 1,000 of the total military population examined, as contrasted with 5.2 per 1,000 of civilian employees referred for study. The higher civilian rate is to be expected, considering that the civilians comprise an older age group and are not required to pass rigid physical examinations as are Navy and Marine Corps personnel.

The total civilian population employed by the U. S. Navy during calendar year 1954 was 388,091 (excluding those who are examined by the Civilian Employees' Health Service of the Department of Defense). The Navy successfully examined 376,797 (97.1 per cent) of these employees, and most of the 2.9 per cent not examined may be accounted for as being on annual or sick leave at the time a mobile or stationary unit was conducting the yearly survey.

It may be seen from table 2 that in all classes more referrals were advised for suspected nontuberculous conditions than because of tentative diagnoses of tuberculosis. Among civilian employees, however, the rate of suspected tuberculosis closely approximates that of all other suspected intrathoracic lesions and is double the rate for all categories of persons examined. The low rate of 0.7 per 1,000 for Navy and Marine Corps personnel suspected of having tuberculosis is explained by the fact that the majority in this class are young and many have recently passed physical examinations incident to coming on active duty or reenlisting.

The rate of suspected tuberculosis for dependents of active-duty personnel closely approximates the rate for all classes. According to data furnished by the Marine Corps and the Bureau of Naval Personnel, there were 770,000 Navy and Marine Corps dependents as of December 1954. This means that only about 6 per cent of the dependents were examined by the Navy through its 70-mm photofluorographic program. It is assumed that many others

TABLE 1. *Summary of findings; Navy 70-mm photofluorographic program, 1954*

Category of subject	Number* of persons examined	Number with suspicious lesions			Number hospitalized for clinical study
		Total	Field reading	Bureau review (additional)	
Total	1,543,644	38,007	36,618	1,389	4,053
Military personnel**	1,112,359	25,298	24,486	812	1,878
Civil-service employees	376,797	11,610	11,091	519	1,969
Dependents of Navy and Marine Corps personnel	49,379	887	829	58	137
Others	5,109	212	212	0	69

*On 33,871 of these persons, a re-take was required to obtain a satisfactory photofluorogram.
**Includes Navy and Marine Corps active-duty and retired personnel, and reserves not on active duty.

TABLE 2. *Presumptive diagnoses prompting referral for clinical study as a result of the Navy 70-mm photofluorographic program, 1954*

Category of subject	Total	Suspicious for		Rate per 1,000		
		Tuberculosis	Other conditions	Total	Tuberculosis	Nontuberculosis
Total	4,053	1,717	2,336	2.6	1.1	1.5
Military personnel	1,878	741	1,137	1.7	0.7	1.0
Civil-service employees	1,969	900	1,069	5.2	2.4	2.8
Dependents of Navy and Marine Corps personnel	137	56	81	2.8	1.1	1.7
Others	69	20	49	13.5	3.9	9.6

were examined by local county or city health department facilities, but it appears desirable to obtain a larger survey coverage of this group in order to reduce the possible contact of military personnel with tuberculosis.

The rates reported in table 2 under the category of "Others" relate to a population of only 5,109, which is too small for statistical significance.

Table 3 gives the results of the second reading, or review, by the Bureau of Medicine and Surgery of all films taken in the field. An additional 1,389 suspicious 70-mm films were found, and letters were sent concerning the suspects requesting 14- by 17-inch chest roentgenograms. From the 1,389 requests, 908 replies were received, representing a response of 65.3 per cent.

TABLE 3. *Results of review of photofluorograms at Bureau of Medicine and Surgery 1954*

Category of subject	Number found with suspicious lesions		Replies indicating that case was referred for further study		
	Letters sent	Replies received	Total	Suspected tuberculosis	Other conditions
Total	1,389	908	165	95	70
Military	812	498	53	30	23
Civilian	519	372	108	62	46
Dependents	58	38	4	3	1

No reports were received by the Bureau of Medicine and Surgery relating to 481 persons for whom re-examinations were requested. Many of these examinations may have been performed at the local level and proper disposition of the individual cases made; but since no official notification was received from this rather substantial group, no interpretation nor comparison of the data included in table 3 can be made with any degree of accuracy. It merely can be stated that of the 908 replies received, 165 indicated that the subjects were referred to various medical activities for further clinical evaluation, 95 for possible tuberculosis, and 70 for other types of chest disease.

SUMMARY

The U. S. Navy controls its tuberculosis problem by (1) an annual 70-mm photofluorogram screening program; (2) routine tuberculin skin testing of all Navy and Marine Corps recruits; and (3) the isolation, study, and treatment of patients with chest disease at centers established at the U. S. Naval Hospitals at St. Albans, Long Island, N. Y., and San Diego, Calif.

During the calendar year 1954 mobile and stationary units successfully examined 1,543,644 persons by photofluorograms; of these, 1,717 were disqualified from work or duty for possible pulmonary tuberculosis, and 2,336 for other possible pulmonary disease. Among the persons referred for study, 95 suspected of having tuberculosis and 70 suspected of having other chest disease were discovered as a result of reviewing all films at the Bureau of Medicine and Surgery.

ACKNOWLEDGEMENT: The authors wish to express their appreciation to Dr. W. V. Charter and Mr. L. P. Hellman of the Bureau of Medicine and Surgery for their aid in preparation and interpretation of the tables.

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ONE DOCTOR PER ___.

According to the most recent available figures,* the following list shows the population per physician in representative countries of the world:

United States	777	Austria	646
Canada	989	USSR	758
Mexico	2,504	Italy	841
Argentina	1,378	Spain	1,012
Venezuela	1,907	France	1,146
Brazil	3,288	United Kingdom	1,145
Israel	431	Japan	1,055
Iran	2,302	India	5,806
Egypt	3,625	China	22,000
Syria	5,276	Pakistan	36,000
Algeria	5,304	Ethiopia	164,000

**Bull. World Health Organ.* 13: 345, 1955.

ROLE OF THE HYPERIMMUNE REACTION IN CHANCROID

Effect of ACTH

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THE usually described features of chancroid are the characteristic penile ulcers appearing after intercourse, buboes, positive results of the Ito-Reenstierna test, and the isolation of *Hemophilus ducreyi* from the ulcer and from the secondary pustules at the sites of artificially induced autoinoculation.[1-3] The primary ulcer is sometimes herpetiform in nature, but it is frequently ragged, dirty, tender, and nonindurated, and it tends to bleed easily. Some of the patients then experience pronounced inguinal adenitis, or buboes, which may be either unilateral or bilateral. These inflamed nodes may enlarge rapidly and become exquisitely tender; in this stage, the skin overlying the lymph nodes is usually a deep red, surrounded by a lighter blanchable zone several inches in diameter.

The striking deep-red color of the skin overlying the node and the surrounding lighter erythema are the same color as the red-centered Ito-Reenstierna reaction with its surrounding flare. It was this similarity in appearance of the involved node and the associated positive reaction produced by this intradermal test, a type of reaction generally accepted as a hyperimmune response, that first suggested the possible role of the hyperimmune phenomenon, or destruction of tissue by host reaction, in the clinical characteristics of chancroid. It appeared conceivable that the hyperimmune phenomenon could be essential in the destructive necrotic nature of the penile lesion and the highly inflamed lymph nodes, as well as in the associated positive intradermal reaction.

To test this hypothesis, corticotropin (ACTH) was used in the three cases of chancroid to be presented.

CASE REPORTS

Case 1. A 19-year-old white youth was examined 29 June 1953, because of an ulcer on his penis and bilateral soreness in the groin of one week's duration and enlargement and tenderness of a right inguinal

From U. S. S. *General J. C. Breckinridge*. Dr. Tyler is now at the Mayo Foundation, Rochester, Minn.

lymph node of three days' duration. Sexual exposures had occurred 7 June 1953 (Japan), 4 June 1953 (Okinawa), and 27 April 1953 (Japan).

On the left side of the penis near the corona was a moderately dirty ulcer with a ragged base and an indurated border. Slight manipulation caused bleeding. A moderately tender lymph node measuring 0.5 to 1 cm in diameter was noted in the left inguinal region. On the right was an extremely tender inguinal lymph node 2 cm in diameter, with an overlying erythematous zone 8 cm in diameter that blanched with pressure.

The penile lesion was slightly worse on the next day; the left node was more tender and the right node now measured 3 to 4 cm in diameter and was exquisitely tender. Rest in bed was instituted.

His condition was essentially the same on 1 July, on which day the Ito-Reenstierna reaction (48 hours) showed a center measuring 1.5 cm in diameter and a 4-cm flare. Results of a Frei test were negative. Artificial autoinoculation on the thigh had resulted in three small, yellow papules with raised erythematous bases about 8 mm in diameter. Between 0900 and 1145 hours on the same day, a total of 80 mg of ACTH was given intravenously in 1,000 ml of a 5 per cent solution of dextrose in distilled water. The flare around the Ito-Reenstierna reaction was almost gone by 1400 hours. The patient noted slight improvement in the right node. At 1700 hours he stated that the pain and tenderness had decreased by half since that morning. The nodes on the left, which now were shotty, were only slightly tender. The erythema had decreased on the right side and the previously exquisitely tender node now was only moderately tender. Another 20 mg of ACTH in 500 ml of solution was given intravenously that evening. The redness over the groin continued to decrease. The Ito-Reenstierna reaction was now extremely faint and was without induration or deep central color.

On 3 July the patient subjectively was worse; the nodes on both sides were larger and moderately tender and were surrounded by slight flares. He stated he had "not quite twice" the pain. His condition having remained unchanged for 36 hours, he was given an intravenous injection of 40 mg of ACTH in 1,000 ml of the same solution between 1100 and 1500 hours on 5 July. By 2100 hours the induration around the nodes had decreased greatly and the patient was much better subjectively. Administration of Terramycin (brand of oxytetracycline), 1 gram four times daily, was begun.

The 40-mg dose of ACTH was repeated on 6 July. By 10 July the penile ulcer was epithelized but the sites of autoinoculation on the thigh still were crusted. One week later the thigh was healed and use of Terramycin was discontinued. The patient was kept under observation to 12 August without evidence of recurrence.

Dark-field examination for *Treponema pallidum* was negative. Smears from the penile lesion stained by Gram's method disclosed many gram-

positive cocci and diplococci, some in epithelial cells and some in polymorphonuclear leukocytes. Some of the leukocytes containing these diplococci also contained extremely small gram-negative organisms that were round and about a third the size of small cocci. Some appeared in pairs, whereas some were in extracellular clusters. Two round, gram-negative cocci were seen.

Giemsa's stain revealed bacteria of different sizes in some leukocytes; some of the smaller forms stained violet.

Macchiavello's stain showed the same type of bacteria; some extremely small forms stained red, and a few stained blue. Preparations stained with hematoxylin and eosin disclosed scattered bright-orange bodies about half the size of polymorphonuclear leukocytes. Some of these were in polymorphonuclear leukocytes, whereas some were in large monocytes; none were seen in epithelial cells. In general, smears from the sites of autoinoculation revealed no bacteria or smaller forms; however, rare, small, red cocci were seen in preparations stained by Macchiavello's method.

The buboes of chancroid responded dramatically to ACTH therapy in this case. After the initial response, the lymph nodes again became enlarged and tender but again subsided on further use of ACTH, showing that the initial great improvement was produced by the ACTH. Repeated Ito-Reenstierna tests showed that the positive reactions decreased concomitantly with decrease in size of the buboes, which may be considered evidence that both are intimately associated with a similar response of the hyperimmune type.

Since the clinical course of the disease was only about two weeks, the ACTH apparently did not produce any harmful effect. After receiving 4 grams of Terramycin daily for five days, the patient was clinically cured except for the sites of autoinoculation, which required therapy for seven more days.

Case 2. A 22-year-old man, half Hawaiian and half Chinese, was examined on 26 March 1953, because of a sore on his penis and pain in the left inguinal region of one day's duration. The last intercourse had been 10 days before. Examination disclosed a 2-cm lesion on the dorsum of the penis that was red and swollen, with a crusted ulcer 5 mm in diameter in the central part (fig. 1a). Pressure caused about 1 ml of pus to be expressed. Slight tenderness was present in the left inguinal region, but lymph nodes were not palpable. A slight mucoid discharge from the urethra was noted.

A first-glass specimen of urine was loaded with pus cells, whereas a second-glass specimen contained only two or three cells per high-power microscopic field. Results of repeated dark-field examinations were negative. A presumptive Kahn test gave a negative reaction. Gram's

stain applied to smears from the lesion disclosed no bacteria. Macchiavello's stain revealed a few small diplococci, some extracellular and some in leukocytes. A number of red-staining round forms, subbacterial in size, were seen in the cytoplasm of epithelial cells. These varied in size down to organisms just visible microscopically. Results of the Ito-Reenstierna test at 14 hours disclosed a reaction with a 12-mm center and a faint flare. Results of the Frei test were negative. The patient was put at rest in bed.

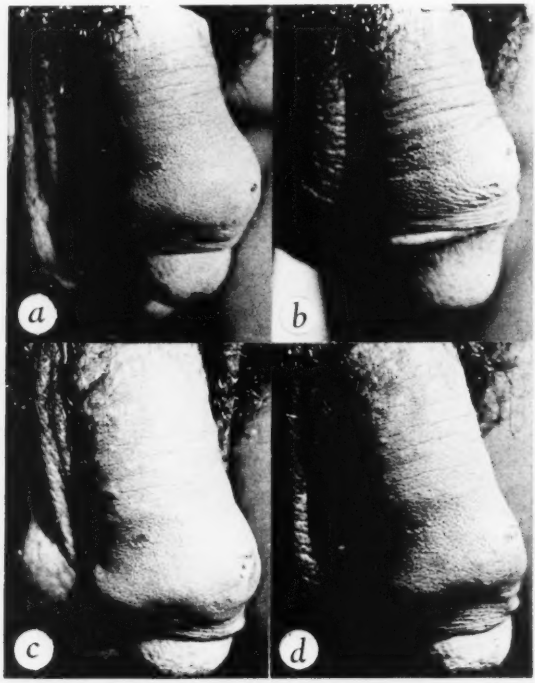

Figure 1 (case 2). Penile lesion. (a) *Prior to treatment.* (b) *Appearance 30 hours after use of corticotropin (ACTH) and rest in bed. This change was evident about 4 hours after the infusion of ACTH was started.* (c) *Appearance 20 hours after* (b), *without intervening treatment. This shows that the improvement shown in* (b) *was probably caused by the ACTH.* (d) *Appearance after antibiotic therapy and further use of ACTH.*

No change was apparent by the next day, so a total of 40 mg of ACTH in 1,000 ml of a 5 per cent solution of dextrose in distilled water was given between 1300 and 1830 hours. By 1700 hours there was great improvement and almost all the edema of the lesion had disappeared. Only a drop of pus could be expressed. The intradermal reaction had faded greatly.

Nine hours later, at 0200 hours, on 28 March, the lesion again was swollen and the intradermal reaction was more red. Therefore, another 40 mg of ACTH was given in the same solution over a four-hour period. A fair additional response was noted. Ice packs were applied that afternoon; no significant change had occurred since morning (fig. 1b).

The lesion again became swollen, red, and slightly tender on 29 March (fig. 1c). Pressure caused about 1 ml of pus to exude. From 1400 to 2100 hours the patient received 40 mg of ACTH intravenously. By 1700 hours the Ito-Reenstierna reaction had receded and was not tender (it had been tender prior to the use of ACTH). The edema of the penis had decreased.

On the morning of 30 March the lesion again was swollen. Another intravenous dose of 40 mg of ACTH given as before yielded good improvement. Use of Terramycin in 1.5-gram doses was begun that afternoon. The lesion became slightly more edematous on the following evening, but by the next morning it appeared to be healing (fig. 1d).

The lesion was completely epithelized by 6 April and the patient was prepared for dismissal.

A clear-cut decrease in the destructiveness of the penile lesion followed administration of ACTH in this case; a "flare-up" occurred later, with repetition of the response to additional ACTH therapy. The intradermal reaction showed the same course noted in case 1. Response to use of antibiotics was exceptionally good; 13 grams of Terramycin given in 40 hours proved adequate.

Case 3. A 19-year-old white youth was examined on 13 July 1953, because of a sore left groin of eight days' duration. The patient had noted a penile ulcer on 25 June; this lesion was approximately 4 mm in diameter. He had received dihydrostreptomycin daily for seven days, and the lesion apparently had healed after three days. He had had a "chancroid" with soreness of the left groin in January 1953, soreness of the groin again in March 1953, and gonorrhea on 1 June 1953, all of which were treated.

Examination disclosed a matted, flat, moderately tender lymph node in the left inguinal region measuring 2 cm in diameter. An Ito-Reenstierna test resulted in a reaction with a 12-mm center and a flare measuring 3 to 7 cm. A Frei test gave a negative reaction.

The groin still was moderately tender on the next day but some improvement was noted. Administration of Aureomycin (brand of chlortetracycline), 1 gram four times daily, was begun.

No change was evident three days later; rest in bed was instituted and use of antibiotics was discontinued. The Ito-Reenstierna reaction still had a red indurated center that was slightly tender. The patient received 80 mg of ACTH given intravenously between 1130 and 1830 hours on this same day, 17 July 1953. By 1900 hours the region of the

intradermal reaction was no longer indurated and tender. The patient stated that 75 per cent of the tenderness in the nodes was gone. The mattedness had decreased.

Examination on 20 July disclosed a slightly tender, firm, left inguinal node measuring 3 to 4 cm in diameter. Administration of Terramycin, 1 gram four times daily, was begun. On 22 July the node was 2 cm in diameter and was moderately tender. On that day he received 40 mg of ACTH given intravenously between 0930 and 1330 hours. By 1400 hours the tenderness was gone and the node was softer and smaller. His condition was essentially the same on 27 July. There was no additional follow-up.

In this case, adenitis associated with a positive Ito-Reenstierna reaction developed or recurred in spite of treatment with dihydrostreptomycin; it also proved resistant to Aureomycin and Terramycin. It was again shown that ACTH can decrease the edema, erythema, and tenderness of buboes, this being demonstrated by an initial favorable response followed by a "flare-up" that again responded to further use of ACTH. The positive Ito-Reenstierna reaction and the clinical appearance varied simultaneously when ACTH was given.

DISCUSSION

From the similarity in appearance of the positive Ito-Reenstierna reaction, which generally is accepted as a hyperimmune phenomenon, the destructive necrotic ulcer and the inflamed buboes, and from their concomitant decrease in inflammatory appearance with use of ACTH as noted in these three cases, it would appear that the hyperimmune phenomenon is important in the mechanisms of these various features in chancroid. A hyperimmune reaction similar to that induced by the intradermal test also should be expected at the site of induced autoinoculation; theoretically, these two tests are essentially the same except for the method by which the organisms are introduced and the fact that the site of autoinoculation probably includes live organisms capable of invasion of tissue after the initial reaction.

From a practical standpoint, knowledge of the role of the hyperimmune phenomenon in the clinical features of chancroid might aid in forming a proper rationale for methods of treatment. ACTH at times may be a valuable therapeutic adjuvant, especially when it is particularly desired to prevent excessive destruction of tissue or to make the patient more comfortable. Its over-all role in the treatment of the condition remains to be determined.

Rest in bed has been noted by Canizares and Cohen[4] and by me to be important in decreasing or preventing the formation of buboes. This observation appears to be consistent with the bene-

ficial results of rest in bed in other conditions associated with hyperimmune features, such as rheumatic fever, and this mode of treatment might well have a place in some cases of chancroid.

Stained smears from penile ulcers associated with positive Ito-Reenstierna reactions frequently show gram-positive cocci; some smears suggest the possible presence of subbacterial forms. These findings, based on smears without cultures or further virus studies, might in themselves be disregarded as being evidence of secondary contaminants or errors in interpretation. However, when these findings are considered with various reports of other investigators, one might question the accepted etiologic agent of chancroid.

For at least three decades most investigators have accepted the concept that Ducrey's bacillus could produce chancroid. Greenblatt and Sanderson[2] supplied evidence in support of this conclusion. The question still remains as to whether or not other organisms might cause the same clinical condition. Certainly, lymphogranuloma venereum can simulate chancroid. The possibility that other viruses might be involved at times apparently has not been considered in the experimental work of those who believe that *H. ducreyi* is the only cause of chancroid.

This study shows that clinical features of chancroid such as the necrotic ulcer, the autoinoculability, and the bubo might be explained on the basis of a hyperimmune reaction on the part of the host that theoretically might be brought about by more than one organism. With these clinical features possibly being nonspecific in nature, the determination of the cause of chancroid actually depends on the ability to identify the causative organisms by means of smears and cultures and the specificity of the intradermal tests. In some laboratories doing investigative work, organisms morphologically resembling *H. ducreyi* are recognized in smears in only 20 to 60 per cent of diagnosed cases of chancroid;[2,3,5] confirmation by means of culture is notoriously unsatisfactory. Smears from the sites of autoinoculation usually are considered to show *H. ducreyi* more frequently;[3] however, lesions resulting from autoinoculation that clinically may show the characteristics of an artificially induced chancroid have been negative for this organism.[6] As for the specificity of the Ito-Reenstierna and the Frei tests, both of these not infrequently show positive reactions in the same case,[7,8] thus being of little aid in the differentiation of lymphogranuloma venereum and chancroid.[5] I shall present evidence in another study showing that even routine immunization procedures for protection against smallpox, typhus, and cholera probably can influence the results of these tests.

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Another pertinent observation is that sulfathiazole therapy for chancroid produced experimentally by means of *H. ducreyi* need not be given for as long a period as it is for the clinical disease, and the experimentally induced lesion heals in about half the time required for disappearance of the naturally occurring lesions.[9] With these observations in mind, it appears that more investigation concerning the cause of chancroid is indicated.

CONCLUSIONS

The hyperimmune phenomenon, or destruction of tissue by the reaction of the host, appears to play an important role in the clinical features of chancroid. It is probably a factor in the inflammatory and destructive nature of the ulcer and of regional lymphadenitis, in the positive results of the Ito-Reenstierna intradermal test, and in the early reaction at the site of autoinoculation.

Corticotropin (ACTH) decreases the reaction to the intradermal test, the destructiveness of the ulcer, and the inflammatory reaction in the buboes.

Findings on stained smears from chancroid associated with positive Ito-Reenstierna reactions, and other observations, suggest that further work concerning the cause of chancroid may be indicated.

ACTH may be a valuable adjuvant to the treatment of chancroid when it is particularly important to prevent excessive destruction of tissue.

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SICKLE CELL DISEASE

Importance in Military Personnel

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THE DISCOVERY of differences in electrophoretic mobility between the hemoglobin in normal adult blood and that in the blood of sickle cell anemia,[1] and the subsequent identification by the electrophoretic technic of several abnormal hemoglobins,[2-5] have markedly altered the clinical approach to sickle cell disease. The classical division of these differences into an asymptomatic erythrocyte abnormality, sickle cell trait, and a severe hemolytic disease with an obstructive vascular component (sickle cell anemia) has long been considered inadequate. Atypical cases exhibiting considerable variability in symptomatology and clinical course have often disturbed the clinician.[6] The use of electrophoresis of hemoglobin has enabled these cases to be classified on the basis of hemoglobin abnormality into several distinct diseases, for which *sickle cell disease* has been accepted as the generic name. In all of these conditions, sickle cell (S) hemoglobin exists alone or in combination with some other hemoglobin. These are adult (A) hemoglobin, C hemoglobin, D hemoglobin, fetal (F) hemoglobin, thalassemia hemoglobin, and the hemoglobin of congenital hemolytic icterus. Though hemoglobins E, G, and H exist, no cases of combination with sickle cell hemoglobin have been reported.

While the clinical features of these conditions have by no means been completely delineated, sufficiently distinct characteristics are present to suggest the abnormality involved; electrophoresis can usually provide final proof.

As the sickle cell variants are inherited and are associated with a wide spectrum of clinical severity, individuals with mild examples of these abnormalities are inducted into the military service. Subsequently complications of these diseases may supervene, leading to complaints while in the service. Indeed, one of the most striking complications of sickle cell disease—splenic infarction during air travel—has been described ex-

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clusively in military personnel.[7-12] This article presents four cases of sickle cell disease encountered over a short period of time in two Air Force hospitals and reviews the clinical features of the sickle cell variants which are helpful in the diagnosis of these conditions.

SICKLE CELL TRAIT

Case 1. An 18-year-old Negro airman was admitted to the 6022d U. S. Air Force Hospital because of fever and malaise.

The patient had been in exceptionally good health all his life. He was asthenic in habitus with somewhat disproportionately long arms and legs, but his history failed to suggest any developmental abnormalities. Several physical examinations, upon induction and during a hospitalization for an upper respiratory infection, were normal.

In January 1955 he developed a penile ulcer. Dark-field examination was reported as negative, and *Hemophilus ducreyi* was identified in smears from the lesion. Therapy consisted of streptomycin sulfate and sulfadiazine; a serologic test for syphilis in March was negative.

On 19 April he developed malaise and fever, and was admitted to the hospital with a diagnosis of acute bronchitis. The acute febrile illness cleared rapidly, but laboratory studies on admission revealed the following: hemoglobin 9.5 g/100 ml; cardiolipin titer positive in a 1:128 dilution. Five days later the hemoglobin was 10.9 g/100 ml; the red blood cell count, 3,440,000/μl, and the hematocrit, 37 ml/100 ml. Reticulocyte counts were 1.0 and 0.6 per cent on two occasions. Repeated stool examinations were negative for blood. A sickling preparation using sodium metabisulfite revealed 75 per cent sickling in six hours; 90 per cent after 24 hours. Slight sclerosis of the inner table of the skull was noted on roentgenographic examination. Electrophoretic analysis of the patient's hemoglobin revealed it to be a mixture of sickle cell and adult hemoglobin (fig. 1); 2.8 per cent of the latter, however, proved to be fetal hemoglobin. Subsequently, the fecal urobilinogen was normal.

The patient was given a course of penicillin. His red blood cell count rose slowly; two months after admission the hemoglobin was 12.5 g/100 ml; the red blood cell count, 4,470,000/μl; and the hematocrit, 40 ml/100 ml. The cardiolipin titer had fallen to 1:16.

Comment. The sickle cell trait (sicklemia) is the heterozygous form of sickle cell disease; the erythrocyte contains a mixture of sickle cell and normal adult hemoglobin. Sickle cell hemoglobin constitutes less than 50 per cent of the combination. The trait cells are not sickled on stained smears of blood, but sickling can uniformly be produced by the use of reducing agents, though usually more slowly than in sickle cell anemia. While this abnormality has been associated with the Negro race (8 per cent of American Negroes and up to 46 per cent of some African

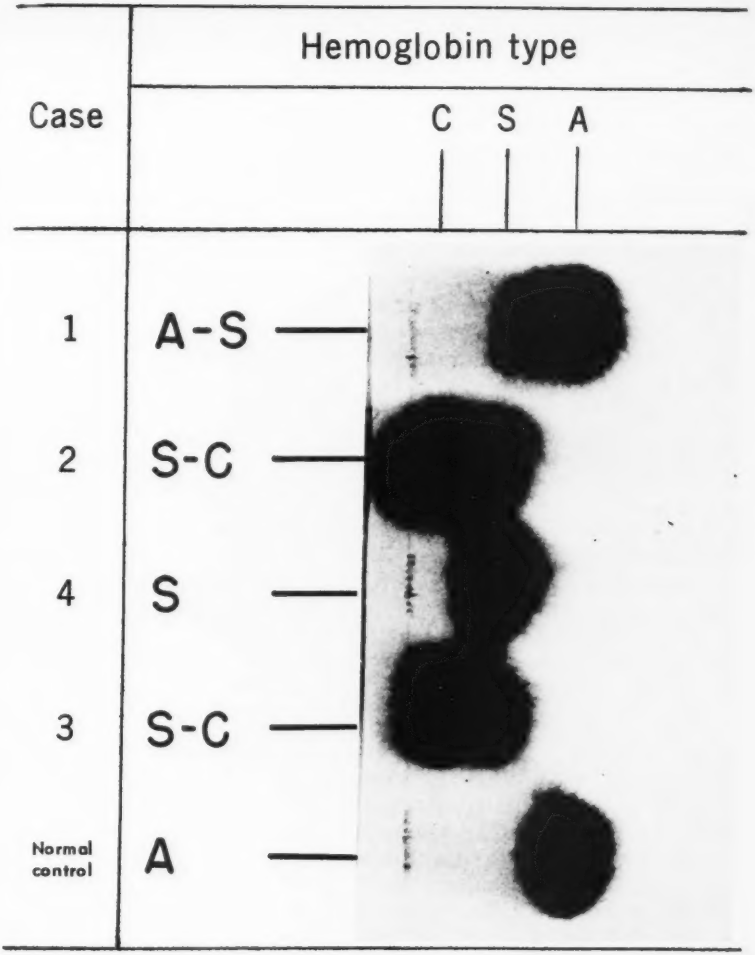

Figure 1. Paper electrophoresis of hemoglobin (performed by the 406th Medical General Laboratory, Tokyo, Japan). The second column lists the hemoglobin abnormality and illustrates the spectrum of abnormalities described. The A hemoglobin is the most rapidly migrating component; C is the slowest. S hemoglobin lies midway between these two.

tribes exhibit it), individuals who are Caucasian by all other criteria have been reported to demonstrate it as well. The highest incidence is seen in persons of Greek and Italian extraction. The question of admixture of Negro blood, interesting to the anthropologist, has no meaning to the clinician; clinically the abnormality is not confined to Negroes.

The sickle cell trait has traditionally been considered as without pathologic significance. Sporadically, however, cases of vascular obstruction by sickled cells in the absence of anemia were reported, involving the brain, lungs, kidneys, spleen, and retina.[13-16] Bauer and Fisher[17] described an instance of abdominal crises in a sicklemic without anemia; however, until the report of Ende, Pizzolato, and Ziskind[18] none of the cases were proved electrophoretically. In three of the four cases reported by the latter group, the presence of the sickle cell trait was confirmed by electrophoresis. Impaction of the sickled cells in blood vessels gave rise to encephalomalacia and cerebral hemorrhage, priapism, and small bowel infarction. Edington and Lehmann[19] also have described hematuria in an 18-year-old African Negro woman with a proven sickle cell trait and no other apparent cause for the renal bleeding.

The sickle cell trait has been mentioned as exerting an effect under some other circumstances. Weiss and Stecher[20] have found a higher incidence of the trait in patients with tuberculosis and suggest some predisposition to tuberculosis in sicklemics. The response to therapy, however, was not different from that of normal controls.[21] Sickle cell trait cells are also apparently resistant to destruction by *Plasmodium falciparum*;[22, 23] the selective advantage this confers in regions endemic for malaria has been advanced to explain the persistence of sickle cell anemia in certain areas. The sickle cell trait has also been shown to predispose to splenic infarction during flight.[24, 25]

Although impaction of sickled trait cells in blood vessels may give rise to clinical syndromes mimicking sickle cell anemia, the life span of trait cells is identical to that of normal cells.[26] Aplastic crises, not uncommon in sickle cell anemia, have not been reported in the trait. Consequently, if electrophoretic studies confirm the presence of sicklemia, the presence of anemia should stimulate the clinician to search for other causes of anemia.[27] The case reported above illustrates this feature; a syphilitic infection and acute bronchitis were discovered to be present. In addition, all associated evidences of a hemolytic process were absent (hyperbilirubinemia, reticulocytosis, increased fecal urobilinogen). While depression of the bone marrow by acute infections of this type is rare, the spontaneous improvement seen after therapy of the infection suggests a causal relationship to the anemia.

SICKLE CELL-HEMOGLOBIN C DISEASE

Case 2. A 20-year-old Negro airman was transferred to the 6407th U. S. Air Force Hospital for investigation of anemia. He had experienced recurrent attacks of joint pains since childhood. During these, swelling and tenderness of the joints had been present, but no residual

deformity had resulted. Physical examination revealed some puffiness of the eyelids and a firm spleen, palpable one and one half fingers-breadth below the costal margin.

Laboratory studies on admission were as follows: hemoglobin, 11.2 g/100 ml; hematocrit, 38 ml/100 ml; serum bilirubin, 1.14 and 0.8 mg/100 ml. Specific gravity of the urine was low and remained so for the entire hospital course. Frequent target cells were present in blood smears; the red cells began hemolysis at 0.36 per cent saline and were completely hemolyzed at 0.22 per cent. After several negative tests for sickling, repeated tests revealed 40 per cent sickling in 24 hours. Except for a phenolsulfonphthalein excretion of 47 per cent in two hours, all tests of renal functions were normal. The reticulocyte count was elevated (maximum of 4.4 per cent) on several examinations; the fecal urobilinogen was 232 Ehrlich units per 100 g of feces. Additional blood counts during the hospital course were as follows: hemoglobin, 11.2 g/100 ml; red blood cell count, 3,950,000/μl; hematocrit 38 ml/100 ml. Examination of bone marrow revealed normoblastic activity. Roentgenograms of bone were normal.

Electrophoretic study of the hemoglobin demonstrated it to be a combination of sickle cell and C hemoglobins in a proportion of 38 to 62. Fetal hemoglobin was 1.5 per cent (fig. 1).

Studies performed at Letterman General Hospital revealed, in addition, a red cell survival time of 40 days by the radioactive chromium method.

Case 3. A 19-year-old Negro airman entered the 6022d U. S. Air Force Hospital complaining of severe left upper-quadrant and left flank pain of three days' duration. The onset was abrupt, beginning on an airplane flight and persisted until he was admitted to the hospital. Arm and leg pain had been noted by the patient since the age of 12 years. He had been hospitalized in Korea several months previously for obscure leg pains but denied any jaundice, anemia, or abdominal pain. Both parents and four siblings were alive and well.

The patient was a tall, thin man with somewhat disproportionately elongated extremities, complaining of left upper-quadrant and left flank pain. Tenderness and rigidity were present in these areas. Fever was low grade. The liver was enlarged to 2 cm below the right costal margin. The spleen could not be felt but muscle guarding made palpation difficult.

The white blood cell count was elevated. The hemoglobin was 14.2 g/100 ml; the hematocrit 47 ml/100 ml; the sedimentation rate 4 mm per hour. About 44 per cent of the red cells on stained smear were target cells. The routine moist preparation failed to demonstrate sickling but with the use of stasis or sodium metabisulfite (2 per cent) there was 75 per cent immediate sickling (fig. 2). The osmotic fragility of the red cells was decreased, hemolysis beginning at 0.35 per cent and com-

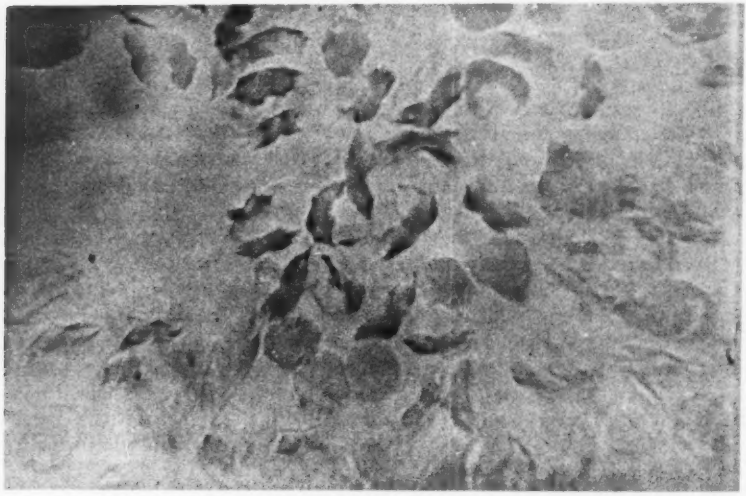

Figure 2 (case 3). Photomicrograph of an unstained moist preparation of the patient's sickled cells (2 per cent metabisulfite).

plete at 0.05 per cent. (Control values were 0.50 and 0.35 per cent respectively.) Reticulocyte counts were 1.5 and 0.7 per cent on two occasions. Some hematuria and albuminuria were present on admission but cleared rapidly. The urine was completely normal thereafter. The serum bilirubin was normal; the thymol turbidity was persistently elevated. The cephalin flocculation, normal on admission, became elevated some months after the acute episode. The fecal urobilinogen was 267 Ehrlich units per 100 g of feces (normal: 80-250). There was no bromsulfalein (brand of sulfobromophthalein sodium) retention.

Roentgenograms showed elevation of the left dome of the diaphragm and an enlarged splenic shadow; those of bone revealed osteoporosis of the shafts of some long bones. Dental roentgenograms were interpreted as demonstrating osteoporosis of the mandible and maxilla.

The patient's temperature rose to a maximum by the second hospital day and remained elevated for four days. Abdominal pain and rigidity were present for a similar period. Thereafter, fever and abdominal pain subsided slowly. Repeat roentgenograms showed recession of the previously enlarged spleen, though even when abdominal rigidity disappeared the spleen was never palpable. The blood count remained at the same level throughout the hospitalization. The patient was returned to duty; however, further flying was contraindicated.

Approximately two months later, the patient returned with priapism. When other measures, including spinal anesthesia failed, irrigation of

the corpora cavernosa with streptokinase and streptodornase resulted in loss of the erection. This has not recurred.

Electrophoretic study of the patient's hemoglobin by both filter paper and moving boundary methods revealed it to be a combination of sickle cell and C hemoglobin in a proportion of 37 to 63 per cent respectively (fig. 1).

Comment. Enough information based on several series[28-30] has been published to establish the fact that the combination of sickle cell and C hemoglobin (sickle cell hemoglobin constituting 30 to 50 per cent of the mixture) results in a disease with fairly distinctive clinical and hematologic features. One of the most striking of these is the patients' relatively late age at onset of symptoms, especially in comparison with those having sickle cell anemia. Half of the patients reported first note symptoms after 10 years of age; some have lived to advanced ages without complaints. Abdominal pain occurs in only one fifth of the patients; bone pain and/or arthralgias are present in roughly 70 per cent. These pains range from mild and transient to severe and persistent, but the episodes are infrequent. Hemolytic crises occur infrequently, though severe ones with marked falls in hemoglobin levels have been reported. Central nervous system manifestations (convulsions and subarachnoid bleeding) have been seen in a few patients. Smith and Conley[28] have commented on the frequency of aseptic necrosis of bone in patients with this disease. These authors also suggest that severe hemolytic crises associated with pregnancy occur frequently in this variant, more so than in sickle cell anemia.

Splenic enlargement is encountered in 65 per cent of cases. In three reported patients, prolonged follow-up revealed that a previously palpable spleen receded to normal size. This recession is probably on the basis of small infarctions with fibrosis; the meager pathologic information available substantiates this.[28] Intra-ocular hemorrhages were noted in four cases. While gross hematuria has been seen occasionally, the incidence of microscopic hematuria cannot be ascertained.

The outstanding hematologic abnormality of this disease is the presence of large numbers of target cells[31] (figs. 3 and 4). With few exceptions, these exceed 50 per cent in the stained smear, and have reached 85 per cent. As a consequence, the osmotic fragility of the red blood cells is decreased, often markedly. Sickling is seldom present on the stained smear, but is usually seen in moist preparations. As the life span of the red blood cell in sickle cell-hemoglobin C disease is shorter than normal, anemia is the rule. However, this is seldom severe. In about 25 per cent of cases, normal counts are noted at some time. Some patients are never anemic, indicating that the bone

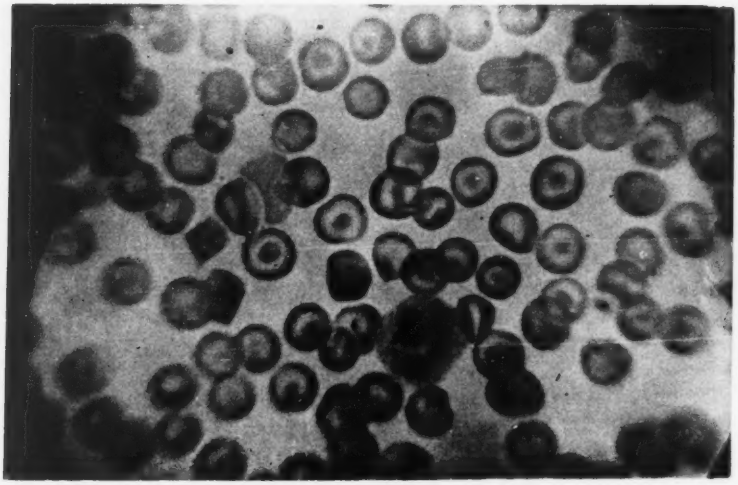

Figure 3 (case 3). Patient's cells stained with Wright's stain, illustrating the large number of target cells found in sickle cell-hemoglobin C disease.

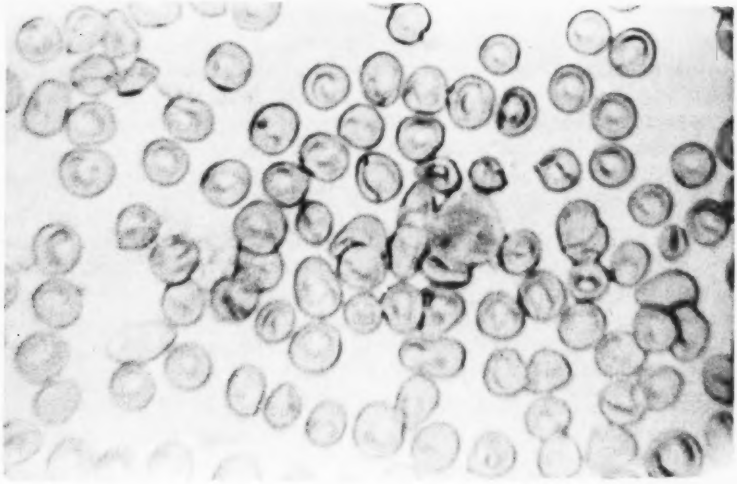

Figure 4 (case 3). Patient's cells unstained, illustrating the central hump of the leptocyte that gives it the typical "target" configuration.

marrow can compensate for the degree of hemolysis. The anemia, when present, is invariably normochromic, but may be either normocytic or microcytic. While reticulocyte levels of up to 30 per cent have been reported, they seldom exceed six per cent and are usually normal at some time in the course of the disease.

Bone marrow aspirations, when done, uniformly reveal erythroid hyperplasia.

Radiologically, bone changes in sickle cell-hemoglobin C disease are mild in comparison to sickle cell anemia. Only a few patients demonstrate sclerotic areas in the long bones. Slight osteoporosis has also been seen. Areas of radiolucency in the mandible and maxilla, with coarsening of trabeculae, are seen in sickle cell-hemoglobin C disease.[24]

Acute splenic infarction occurring during air travel is a dramatic complication of sickle cell disease. Though approximately 30 patients with this complication have been either reported or mentioned in the literature, only 22 have had electrophoretic studies of their hemoglobin. Smith and Conley[24] analyzed the hemoglobin of 15 patients, 11 of whom proved to have the sickle cell trait. Two had sickle cell-hemoglobin C disease and another had probable sickle cell-thalassemia disease. Motulsky and associates,[25] in a series of six examples of this complication, found two to be sickle cell-hemoglobin C disease; one to be sickle cell-thalassemia; and three to be sickle cell traits. Our patient proved to have sickle cell-hemoglobin C disease. Smith and Conley[24] pointed out that the infarctions occurred at lower altitudes on shorter flights in patients with sickle cell-hemoglobin C disease. Furthermore, the frequent finding of sickle cell-hemoglobin C disease in contrast to the rarity of this variant suggests that these individuals are especially susceptible to decreased oxygen tension.

Fixation of the specific gravity and inability to concentrate the urine, while not previously reported in sickle cell-hemoglobin C disease, often has been noted in sickle cell anemia. Since the pathologic findings in both of these conditions are quite similar, except that complications usually occur over a longer period in sickle cell-hemoglobin C disease, it is likely that almost all abnormalities seen in the parent disease will eventually be reported in the variant. Little is known of the reason for this impairment of concentrating power; Kunz and associates[32] confirmed its presence in 15 cases of sickle cell anemia. They ruled out abnormal secretion of antidiuretic hormone as a cause of this failure, localizing the defect to the renal tubules. Hemolysis or repeated, clinically inapparent renal vascular occlusion was suggested as the basis of the defect.

Abnormalities of liver function are also rare in the reported cases of sickle cell-hemoglobin C disease, though not uncommon in sickle cell anemia. Bauer[33] has described vacuolization, fatty change, and necrosis of liver cells in an autopsied case of sickle cell anemia, presumably on the basis of anoxia. Hepatomegaly and the later development of abnormalities of the thymol tur-

bidity and cephalin flocculation in case 3 suggest a similar series of events.

SICKLE CELL ANEMIA

Case 4. An 18-year-old Negro corporal was transferred to the 6407th U. S. Air Force Hospital for investigation of anemia. He had been admitted to another hospital for pneumonia; at that time marked sickling of the red cells, a hematocrit of 32 g/100 ml, and a reticulocytosis of 3 per cent had been noted. In addition, the serum bilirubin had been 2.3 and 1.5 mg/100 ml on two determinations.

Five years previously, the patient had been jaundiced and was told that his liver was enlarged. At that time also, he was given several transfusions. He had also noted occasional pains in the knees and extremities, but had never developed ulcerations of his legs. Physical examination revealed the patient to appear younger than his stated age, and small in stature. There was minimal scleral icterus. The heart was not enlarged nor were any organs palpable in the abdomen.

Laboratory data was as follows: hemoglobin, 9 g/100 ml; red blood cell count, 3,200,000/μl; hematocrit, 32 ml/100 ml; white blood cell count and differential, normal. The serum bilirubin was 1.5 mg/100 ml; the cephalin flocculation was 4 plus; and the bromsulfalein retention was 7 per cent in 45 minutes. Reticulocyte counts were elevated, the maximum being 3.7 per cent. The red cell fragility to saline was decreased. One week after admission, the serum bilirubin rose to 3.46 mg/100 ml, 3.31 mg/100 ml being in the indirect fraction, and concomitantly the hemoglobin was 8.7 g/100 ml and the red blood cell count 3,290,000/μl. Ten days later the serum bilirubin had returned to the initial value; several additional determinations were within the normal range. The blood count maintained its initial level. The electrocardiogram and roentgenograms of bone were normal; however, the urine specific gravity remained at 1.010 on several casual specimens and after a concentration test.

Electrophoretic study of the patient's hemoglobin revealed it to consist entirely of sickle cell hemoglobin (fig. 1). Because of the uncertain prognosis, he was transferred to the zone of the interior for further evaluation.

Comment. Since several complete reviews of sickle cell anemia have been published recently[34, 35] the diverse and protean signs and symptoms will not be discussed here. However, one recent article deserves special attention. Edington and Lehmann[19] published a report of two African Negroes with normal blood counts, including reticulocyte counts, in whom electrophoresis revealed only sickle cell hemoglobin. Both patients gave histories of joint pains in childhood but both were in prolonged remission at the time of blood analysis. Hemoglobin solubility tests[36] further supported that sickle cell anemia was involved. The possibility,

then, that sickle cell anemia may be a benign condition in some individuals, and that as yet undiscovered factors are responsible for the severity of clinical manifestations, must be considered. While the patient presented above is neither asymptomatic nor hematologically normal, his is an unusually benign form of sickle cell anemia. The possibility that others with similar benign conditions or in asymptomatic remissions may be inducted into the armed services again points up the importance of electrophoresis in the precise diagnosis of sickle cell disease.

OTHER VARIANTS OF SICKLE CELL DISEASE

While no examples of sickle cell thalassemia (microdrepanocytic disease) were diagnosed during the period of this study, some cases of this abnormality have been reported in individuals in perfect health, and therefore eligible for induction into military service. Accordingly some of the clinical, hematologic, and electrophoretic features of this disease will be reviewed. Silvestroni and Bianco,[37] in reporting 35 cases, emphasized the variability in severity of the disease and the age of onset of symptoms, though usually the disease is a severe one. Only two of their patients were adults; about half developed symptoms in early childhood and only two were asymptomatic and normal on physical examination at the ages of six and seven, respectively.

Pallor and jaundice are frequent, though jaundice is usually mild. Approximately one third of patients complain of bone and joint pains; when these occur they are often severe, last several days, and are accompanied by fever. Abdominal pain is very frequent, often in the left upper quadrant (suggesting small splenic infarcts) or lumbar (suggesting mild hemoglobinuric nephrosis). Hepatomegaly is frequent but usually moderate; splenomegaly is equally frequent but may be massive. A situation analogous to the autosplenectomy of sickle cell anemia may occur; a previously enlarged spleen may become small and fibrotic. Depending on the degree of anemia, cardiac enlargement and murmurs may occur.

Hematologically the anemia is moderate, the red blood cell count rarely being under 3,000,000 per microliter. The color index is always low (a mean of 0.75); the anemia is microcytic (the mean corpuscular volume and mean corpuscular hemoglobin are uniformly low). Nucleated red cells are rarely present but leukocytosis is frequent. The stained smears typically reveal anisocytosis, poikilocytosis, hypochromia, numerous target cells, elliptocytes, anisochromia, pigmented red cells, and numerous sickled cells. Singer, Singer, and Goldberg[38] reported three cases with additional hematologic data: Reticulocytes varied from 2.8 to 8.67 per cent; osmotic fragility was uniformly decreased; target cells ranged from 12 to 51 per cent. One of the patients

in the latter report was perfectly well at the time of diagnosis and without physical findings; the hemoglobin was 12.3 g/100 ml and the red blood cell count 4,100,000/μl.

The electrophoretic diagnosis of sickle cell-thalassemic disease is somewhat more complex than the other sickle cell diseases and depends on the relative quantity of S hemoglobin. In the sickle cell trait, the amount of S hemoglobin is 25 to 45 per cent; never over 50 per cent. In sickle cell-hemoglobin C disease, it is about 50 per cent. In sickle cell anemia, S hemoglobin constitutes usually 85 per cent of the combination, fetal hemoglobin providing the remainder. In microdrepanocytic disease, sickle cell hemoglobin makes up 65 to 80 per cent of the combination. Electrophoretic analysis of the hemoglobin in sickle cell-thalassemia disease reveals it to consist of a combination of sickle cell, adult, and fetal hemoglobins, the quantity (65 per cent) of S hemoglobin distinguishing it from the trait and the presence of sizeable amounts of normal adult hemoglobin differentiating it from sickle cell anemia. For this to be valid, however, recent transfusions of normal hemoglobin into a patient with sickle cell anemia must be ruled out.

In addition, Sturgeon, Itano, and Bergren[39] alluded to a case of sickle cell-thalassemia disease without demonstrable adult hemoglobin, but details are not available. Family studies or use of solubilities of hemoglobin[36] may be required for a final determination in such cases.

Hemoglobin D is a rare abnormal hemoglobin, thus far identified in only two white families.[39,40] Strangely enough, two members of one family had combinations of sickle cell and D hemoglobin. D hemoglobin is indistinguishable from sickle cell hemoglobin in electrophoretic mobility but differs from it in that it does not cause sickling. The electrophoretic pattern in sickle cell-hemoglobin D disease is identical to that of sickle cell anemia; differentiation requires that one parent have an electrophoretic pattern identical with that of S hemoglobin without manifesting sickling. In addition, the S-D mixture is considerably more soluble in 2.24 M phosphate solutions.[36]

The two known cases, siblings, were markedly different clinically. Though one was incapacitated by frequent crises, the other was clinically well. In the latter, joint pains and anemia were present prior to the age of 10 but since receded. Both patients had moderate anemia, reticulocytosis (7 to 8 per cent), slight leptocytosis (2 to 7 per cent), and normal red blood cell fragility.

Occurrence of sickle cell-congenital hemolytic icterus has been alluded to in one report;[28] clinical details are unknown.

SUMMARY

Sickle cell disease is the term applied to the clinical conditions resulting from the presence of an abnormal hemoglobin (sickle cell hemoglobin) in the erythrocyte. This abnormal hemoglobin may exist alone (sickle cell anemia) or in combination with other normal or abnormal hemoglobins. The resulting disease may have distinctive clinical hematologic features; it may be mild or severe. The factors determining clinical severity are not known. Mild cases may live to military age and be inducted into the armed services. In some instances, such individuals may be capable of full duty; in others complications may arise that lead to severe illness. As the service physician may be called on to diagnose and treat these entities and as the clinical syndromes may often be bizarre, several examples of sickle cell disease are presented and their clinical features reviewed. The electrophoresis of hemoglobin will usually enable a conclusive diagnosis of the underlying hemoglobin abnormality to be made; determination of the percentage of fetal hemoglobin by the alkali denaturation method may be essential in certain circumstances. Rarely, additional procedures (determination of hemoglobin solubility and family studies) are required.

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PULP REACTION TO ULTRASONIC CAVITY PREPARATION

Preliminary Report

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SAMUEL S. PATTERSON, *D. D. S.*
GRANT VAN HUYSEN, *D. D. S.*

WITHIN the last few years the dental profession has been offered a variety of instruments for the purpose of preparing cavities. The operative dentist is constantly striving to obtain an instrument that will fulfill all of the rigid requirements of cavity preparation, and that can be manipulated quickly and still be precise, noiseless, painless to the patient, nonthermogenic to the tooth, and nontraumatic to the pulp and periapical tissue. To date, no one instrument will fulfill all of these requirements.

Several investigators have suggested the use of instruments utilizing high-frequency vibrations,[1-4] and the profession has recently been offered an ultrasonic instrument for appraisal and consideration. A most important question concerning this instrument is "What is the effect upon the pulp when cutting a cavity with a high-frequency, vibrational instrument?" Neilsen[5] has shown that his instrument will cause injury to the enamel organ if used for cutting cavities in persistently growing incisor teeth of the guinea pig. The purpose of the present study is to compare the histologic appearance of pulps in young human teeth in which cavities were prepared with the steel bur, the diamond stone, and the ultrasonic cutting instrument.

METHOD

Noncarious maxillary and mandibular premolar teeth which were scheduled for removal for orthodontic purposes had cavities prepared in them using either a steel bur, a diamond stone, or the ultrasonic instrument.* The steel burs and diamond stones were operated under a stream of water. The cutting of the tooth with the ultrasonic instrument was accomplished with a blunt steel

From Indiana University School of Dentistry, Indianapolis, Ind.

*The Cavitron, purchased from the Cavitron Equipment Corp., Long Island City, N. Y.

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tool having 1/16-inch square working surface and operating at 29,000 vibrations per second in an aqueous slurry of aluminum oxide.

These teeth were then restored with a calcium hydroxide base covered with zinc oxyphosphate cement or amalgam restorations. During the postoperative period no manifestations of unfavorable symptoms such as constant pain or temporary hypersensitivity were observed in any of the teeth. One to two months after being prepared and restored, the teeth were extracted using local anesthesia. The teeth were placed in 10 per cent formalin after the roots were amputated so that the fixative could more readily permeate the pulp tissue.

OBSERVATIONS

The distance between the cavity floor and the pulp (table 1) was measured along the shortest dentinal tubule between the cavity floor and the pulp. Figure 1 shows a photomicrograph of

TABLE 1.

Specimen number*	Tooth	Age of patient	Date of operation (1955)	Cutting tool	Date of extraction (1955)	Distance from cavity floor to pulp
1	$\underline{4}/$	10	1-24	Ultrasonic	2-14	1.55 mm
2	$/\underline{4}$	10	1-24	Diamond 558: H_2O	2-14	1.0 mm
3	$\overline{4}/$	10	2-14	Ultrasonic	4-15	0.2 mm
4	$/\overline{4}$	10	2-14	37 inv. cone: H_2O	4-21	0.25 mm
5	$/\overline{4}$	16	2-14	Ultrasonic	4-15	1.5 mm
6	$\underline{4}/$	13	1-14	Bur + H_2O	3-11	2.5 mm
7	$\overline{4}/$	13	1-14	Steel bur: H_2O	3-11	1.2 mm
8	$/\underline{4}$	13	1-14	Ultrasonic	3-18	0.2 mm
9	$/\overline{4}$	13	1-14	Ultrasonic	3-18	2.5 mm
10	$\overline{4}/$	16	2-24	Ultrasonic	4-28	exposure
11	$/\overline{4}$	10	2-24	Ultrasonic	3-24	1.00 mm
12*	$/\underline{4}$	13	12-10 (1953)	Steel bur	1-24	2.00 mm

*In all cases except No. 12, the filling base was calcium hydroxide and the filling material was cement. In case 12 no filling base was used, and amalgam was the filling material.

the tooth and pulp listed as number 3 in the table. The cavity floor is 0.2 mm from the pulp at the point where the shortest dentinal tubule connects the two. There is an intact line of predentin around the periphery of the pulp, even in the area approximating the dentinal tubules severed by the cavity. It is uniformly thick and shows calcospherites, demonstrating normal calcification of this predentin. The illustration on the right hand margin of the pulp shows vacuolization of the odontoblastic layer. This is assumed to be artefact. There is no hyperemia or leukocytic infiltration in any area of the pulp.

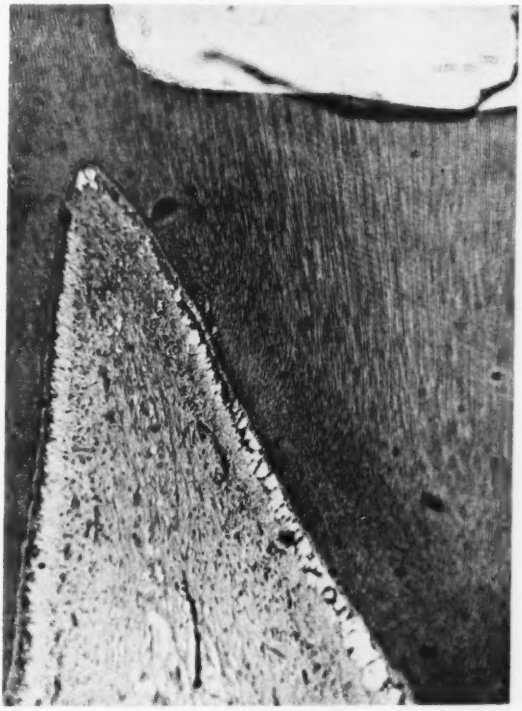

Figure 1. The cavity floor to pulp distance is 0.2 mm, with no pulp reaction. The cavity was prepared with the ultrasonic instrument and restored with calcium hydroxide and cement. (× 250)

Figure 2 shows a photomicrograph of specimen 8 (table 1). This cavity was also cut with the ultrasonic device. The floor of the cavity is 0.2 mm from the nearest part of the pulp. The cavity was restored with calcium hydroxide and cement. The tooth was extracted two months after the restoration had been placed. There

is no evidence of inflammation in the pulp. However, it shows two areas "x" of thickened predentin over the coronal apex and along the right side, opposite the cavity floor. There is little or no increase in thickness of the predentin layer in the zone "y" intermediate to these two thickened areas. The odontoblastic layer approximating the thickened predentin layers is slightly disturbed.

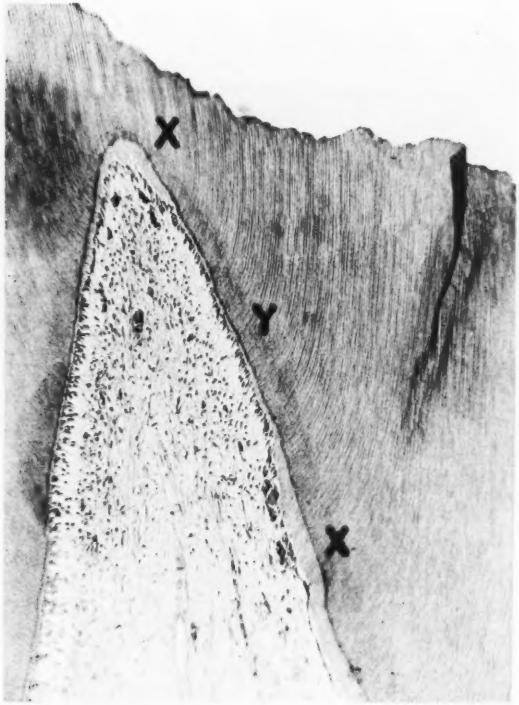

Figure 2. The cavity floor cut with the Cavitron instrument is 0.2 mm from the nearest part of the pulp. The cavity was restored with calcium hydroxide and cement. It shows two areas of secondary dentin "x" over coronal apex and along right side of section. (× 250)

Figure 3 (specimen 10) shows a pulp exposure made with the ultrasonic instrument. The exposure was capped with calcium hydroxide covered with cement. There is no evidence of pulpal inflammation. The large vacuol is assumed to be artefact. In this pulp exposure there was no evidence of an attempt upon the part of the pulp to bridge the exposure with predentin.

Figure 4 shows a photomicrograph of a premolar pulp from a 15-year-old boy. This tooth had been removed for orthodontic reasons 13 months after being restored with a shallow occlusal amalgam restoration. The cavity preparation was made with a steel bur. Figure 4 shows the histologic section of the decalcified tooth. Although the enamel was lost during processing of the tooth for this section, it is obvious that the occlusal cavity was

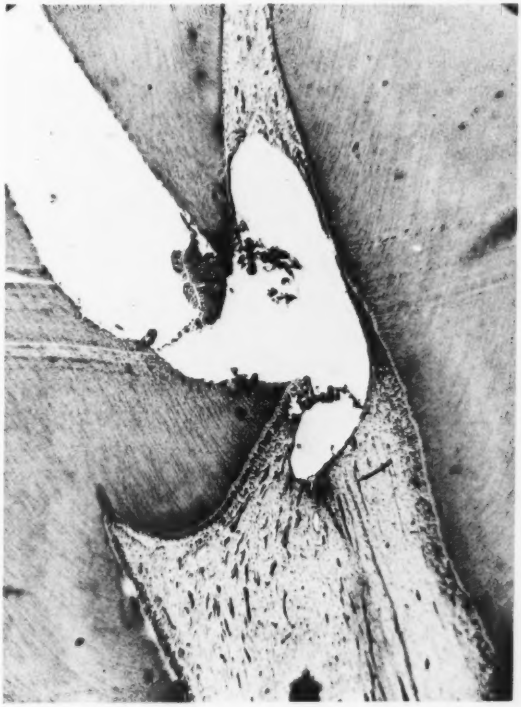

Figure 3. Pulp exposure made by ultrasonic instrument and treated with calcium hydroxide and cement. No pulpitis. (× 250)

a shallow one and the supposedly nonirritating amalgam restorative material was placed at a relatively great distance from the pulp. Just as in figure 2, there is histologic evidence of favorable pulp reaction in two areas. These are indicated at "x" in figures 2 and 4B. Pulp tissue "y" in these two figures located between and on each side of these areas was not affected, yet the dentinal tubules leading to the unaffected pulp periphery were cut during cavity preparation.

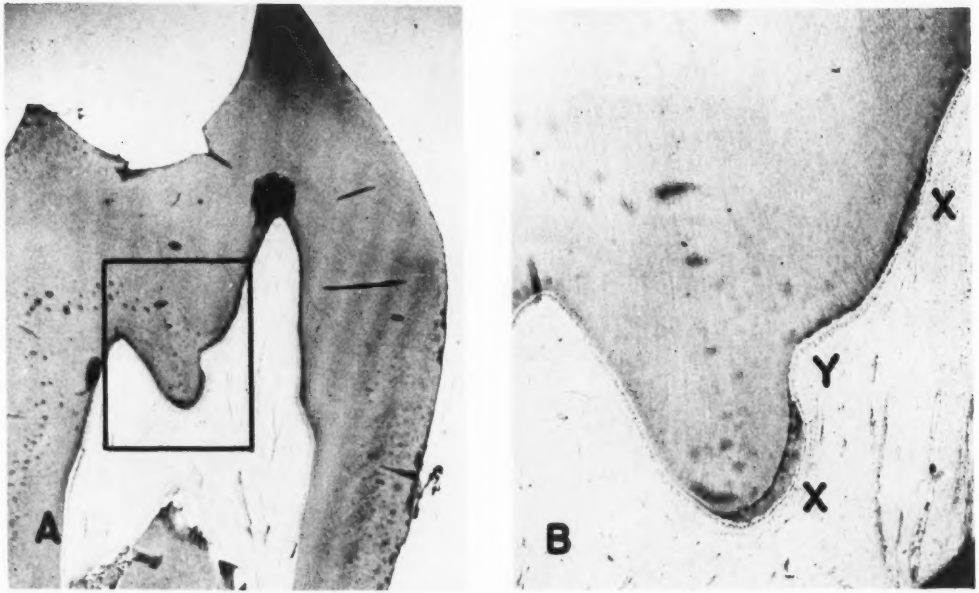

Figure 4. Magnifications of healed pulp injury following shallow cavity preparation with a steel bur and amalgam restoration without a base. The tooth was removed 13 months after filling had been placed.
A: (× 75); B: (× 250); C. *(See page 691.)*

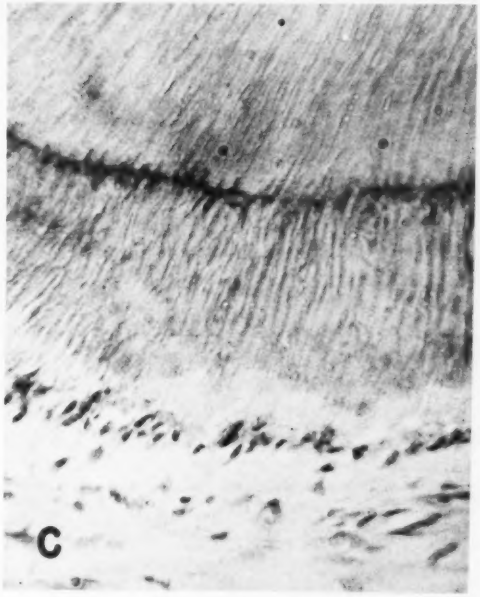

Figure 4C: (× 500) *(See page 690.)*

There is no way of proving what caused this pulp reparative reaction. It occurs in carious and noncarious teeth. The reaction occurs regardless of the instrument used or the restorative material placed. The reaction also occurs under shallow or deep restorations. As far as can be determined, the reparative reaction is associated with the cutting of dentin and takes at least a month to become visible histologically. The teeth indicated in the table as numbers 3, 4, 5, 8, and 12 showed evidence of irregular dentin approximating the cut tubules. Teeth numbered 6, 7, and 9 did not show irregular dentin formation although all of these teeth were removed two months after having been prepared and restored. Why the reaction does not take place in the pulp approximating all cut tubules cannot be explained by this investigation. It should be pointed out that this type of reaction also occurs in response to attrition and caries. It is therefore not a response to the restorative material.

The teeth used in this study were fully erupted and their apices completely formed. However, the apical tissues of the teeth were cut off and discarded so that better fixation of the pulp could be obtained. Consequently, it was impossible in this study to determine the effect of ultrasonic cavity preparation upon tooth formation.

CONCLUSIONS

On the basis of histologic and clinical evidence, no unfavorable pulpal reaction resulted from the use of an ultrasonic cutting instrument for the preparation of cavities in the teeth used in this study.

The reactions of the pulp to the use of the steel bur, the diamond stone, and the ultrasonic instrument for cavity preparation as observed in this study were markedly similar. The observed pulpal reaction to cavity preparation instrumentation is not correlated with cavity depth.

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HOW SIGNIFICANT IS "SIGNIFICANT"?

"The viewpoint that one should pay no attention to the data until a probability of 19 to 1 is attained is altogether unsuited to the doctor's work. Many diagnoses must be made without the confidence that they will be correct 19 times out of 20; many forms of therapy should be initiated when the chances of success are far less than 19 to 1. Often it would be ridiculous to wait until the odds reached "significant" values before acting. While the doctor's common sense will keep him out of trouble in such matters, one wonders whether a lower level of "significance" would not be more appropriate to many medical problems. Most of us would think we were doing well if our accuracy in medical matters approached a probability of 9 to 1. A patient would be glad to undergo any therapy with a 9 to 1 chance of success, nay, even if the odds were only 2 to 1."

—ISAAC STARR, M. D.
in *Journal of American Medical Association*, p. 672, Feb. 25, 1956

FABRICATION OF ACRYLIC JACKET CROWNS WITHOUT LABORATORY FACILITIES

EYMARD L. DOYLE, *Commander, DC, USN*

DENTISTRY IN the armed services calls upon the ingenuity of the dental officer to overcome many problems not faced by his civilian counterpart. One such problem is restoration of the function and esthetic appearance of an anterior tooth that is too badly broken down to be restorable by normal operative procedures. Should a prosthetic facility be present, the problem is minor. There are many dental activities, however, which are not so equipped; then the dental officer may either put on a celluloid crown with silicate cement or place a restoration on the mesial or distal surface without attempting to restore the incisal edge. Both methods leave much to be desired. A method that is felt to be functionally and esthetically more suitable involves the preparation and fabrication of an acrylic jacket crown using the cold-cure acrylic resins. This technic will work as well for posterior teeth as for anterior.

The disadvantages of acrylic in jacket crown prosthesis are well known. It has been found that, due to the resiliency of the material and to masticatory stress, a jacket crown will eventually spread or give at the gingival margin. It is also known that in time the material will show the ravages of wear and necessitate replacement in order to maintain the tooth in proper function. These disadvantages can be overcome by employing a gold casting with a labial window cut for the reception of acrylic. The resulting crown will remain snugly adapted at the gingival margin and resist wear on the incisal and lingual surfaces, yet maintain an esthetic appearance labially.

The technic to be described is a compromise that can be used at dental activities not possessing laboratory facilities. Where a gold and acrylic crown or a porcelain jacket crown is to be constructed, this acrylic jacket crown is highly recommended for use during the time the more permanent jacket is being made.

METHOD

The tooth is prepared in the manner best suited to the operator, except that a shoulder is not desirable. A chamfer finish, or

From Dental Department, Headquarters and Service Battalion, Fleet Marine Force, FPO, San Francisco, Calif.

merely a taper finish to the gingival attachment, is employed. In lieu of the gold casting at the gingival margin, an annealed copper band collar is used to obtain a definite finish line at the gingival attachment and also to help prevent spreading of the acrylic and eventual leakage beneath the gingiva. It will also impart strength to the finished jacket crown.

An annealed copper band that fits snugly at the gingival attachment is contoured accurately to the preparation. The gingival adaptation is checked with an explorer. A cut is made from the incisal edge down toward the gingival margin so that only about 1 mm remains above the gingiva on the labial, incisal, and distal sides, and 3 mm on the lingual. Two or three cuts are placed on the lingual part of the band that extends above the gingiva, to give a mechanical lock for the acrylic.

The copper band collar is then placed in position on the tooth beneath the gingiva. The tooth is isolated with cotton rolls and dried thoroughly. Then with a sable brush, a thin mix of cold-cure acrylic is painted on the tooth and copper band. A small amount of acrylic powder and liquid is placed in a mixing jar; when it has set long enough to be easily handled, it is placed on the tooth and contoured with the fingers. The patient closes his mouth in centric occlusion and the assistant sprays water on the area until the acrylic hardens. It is then removed with a crown remover and a thin mix of acrylic is painted on the area of junction of copper band and crown, and any other area where necessary.

Disks and burs are used in carving, care being taken not to destroy the mesial and distal contact. The crown is tried on the tooth. Centric occlusion is checked for high spots and lateral and protrusive excursions, and the crown is polished with pumice and whiting. The exterior of the jacket crown is lubricated and the prepared tooth dried and cemented in place.

SUMMARY

A technic for the preparation and fabrication of an acrylic jacket crown using an annealed copper band and cold-cure acrylic resin is recommended for use at dental activities without laboratory facilities, or for construction of a temporary crown to be worn while a gold and acrylic crown is being completed. It is believed that by using the copper band collar at the gingival margin, spreading and subsequent leakage will be greatly eliminated, added strength imparted, and a definite gingival finish established. A functional and esthetic acrylic jacket crown can thus be made for patients while in the chair. At any later date, a more permanent gold and acrylic crown can be constructed without need of altering the existing preparation.

Clinicopathologic Conference

Army and Navy Hospital, Hot Springs, Ark.*

ARTHRITIS AND DERMATITIS

Summary of Previous Clinical History. A 47-year-old man had been well until nine months prior to his first admission to this hospital when he noted dull, aching sensations in the hands, wrists, and shoulders. Two months later pain in both hips necessitated his admission to a hospital. He returned to duty in one month but continued to have mild joint pains. After two months he was re-hospitalized because of severe pains in the right hip, knees, fingers, shoulders, and wrists.

FIRST ADMISSION

Four months later he was evacuated to this hospital because of persistence of joint symptoms, generalized weakness, and loss of 20 pounds in weight.

Physical Examination. The patient was a chronically ill man weighing 160 pounds. The head and neck were normal. The heart was small, with a normal rhythm and no murmurs. The lungs, abdomen, genitalia, and prostate were normal. The blood pressure was 134/84 mm Hg. The vital signs were normal. There was mild tenderness in the right knee, elbows, wrists, shoulders, hips, ankles, and metacarpophalangeal and interphalangeal joints of the hands, as well as the metatarsophalangeal joints. There were small subcutaneous nodules on the tip of and just distal to the elbow on each forearm.

Laboratory Studies. The urine was normal with a specific gravity of 1.020. The hemoglobin was 14.2 g per 100 ml, and the white blood cell count was 9,800 per μl, with 65 per cent neutrophils and 35 per cent lymphocytes. The sedimentation rate was 28 mm per hour (Wintrobe). The serologic test for syphilis was negative. The electrocardiogram was normal. Roentgenograms of the chest,

*At the time of this conference, Col. Charles T. Young, MC, USA, was Commanding Officer. From the Department of Medicine, Col. George M. Powell, MC, USA, Chief. Col. Powell is now assigned to Fitzsimons Army Hospital, Denver, Colo.

sacro-iliac joints, shoulders, and elbows were negative, and those of the wrists, hands, knees, and ankles showed osteoporosis.

Course in Hospital. On a program of rest, physical therapy, and salicylates, fair symptomatic relief was obtained. He was discharged four months after admission.

SECOND ADMISSION

During the two years since his first admission, the patient's joint symptoms had continued to be mild, but subcutaneous nodules had appeared at almost every pressure point. Six months previously he had had epigastric pains, and on roentgenographic examination a duodenal ulcer was found. Treatment with a Sippy regimen had relieved the "ulcer" symptoms. This admission was for the purpose of instituting chrysotherapy for his arthritis.

Physical Examination. Abnormal physical findings consisted of weight loss to 118 pounds, tenderness in the midepigastrium, subcutaneous nodules on most extensor surfaces, and marked limitation of motion of the shoulders, elbows, fingers, and knees. The blood pressure was 122/70 mm Hg.

Laboratory Studies. The urine was normal. Hemoglobin was 13.5 g per 100 ml, and the white blood cell count was 6,800 per μl, with 71 per cent neutrophils. Blood urea nitrogen, serum albumin and globulin, sulfobromophthalein sodium test, and gastrointestinal roentgenograms were all normal. Roentgenograms of the feet, hands, and wrists showed marked rheumatoid changes.

Course in Hospital. The patient received 170 mg of gold with alleviation of his arthritic symptoms, but severe dermatitis and vomiting developed, which subsided after chrysotherapy was discontinued. He was discharged on the 82d hospital day.

THIRD ADMISSION

For four months the patient's symptoms had remained unchanged; seven days prior to this admission he developed a sore throat and difficulty in swallowing.

Physical Examination. Physical findings, except for the presence of an injected and ulcerated posterior pharynx, were unchanged.

Laboratory Studies. On admission urinalysis was negative for albumin. The hemoglobin and leukocyte and platelet counts were normal. A cephalin cholesterol flocculation test was 4 plus in 24 hours. A sulfobromophthalein sodium test was normal. A Congo red test showed no dye either in urine or in the second specimen of blood. Esophageal roentgenographic study revealed neuromuscular in-coordination.

Course in Hospital. The sore throat and dysphagia gradually disappeared. On the 47th day his urine gave a 4-plus test for albumin and showed granular casts and white and red blood cells. Thereafter, albumin, casts, and microscopic hematuria remained constant urinary findings. On the 68th day ankle edema was first noted. This disappeared following the administration of mercuzanthin (brand of mercurophylline injection), but in a few days edema returned accompanied by dyspnea and a temperature ranging to 104°F. A roentgenogram of the chest revealed pneumonia and pulmonary congestion. The chest cleared and dependent edema subsided with mercurials, digitalis, and antibiotics. His course thereafter was uneventful and he was discharged on the 104th day.

FOURTH ADMISSION

In the nine-month interval between admissions there had been no essential change. This admission was for the purpose of starting cortisone therapy.

Physical Examination. There was marked multiple joint deformity and edema of the ankles. The heart and lungs were normal. The blood pressure was 160/110 mm Hg.

Laboratory Studies. The hemoglobin was 8.38 g per 100 ml. Urine showed 4 plus albumin and many formed elements. Serum albumin was 3.44 g and globulin 5.28 g per 100 ml. The blood urea nitrogen was 21.7 mg per 100 ml.

Course in Hospital. The patient's weight decreased from 130 to 116 pounds and the blood pressure returned to normal as a result of salt restriction, digitalis, and mercurial diuretics. He was placed on cortisone therapy but relief was minimal. His weight remained stationary and he was discharged on the 57th day on a maintenance dose of 50 mg of cortisone daily.

FIFTH ADMISSION

Three months later he was readmitted because of severe pain in the cervical spine. There had been no other change in his condition.

Physical Examination. New physical findings included marked tenderness and limitation of motion of the cervical spine. The heart and lungs were negative. There was no edema. The blood pressure was 180/100 mm Hg.

Laboratory Studies. The urine showed a specific gravity of 1.020 and gave a 1-plus test for albumin. Serum albumin was 3.85 g and globulin 4.08 g per 100 ml. Serum calcium, phosphorus and alkaline phosphatase, and blood urea nitrogen were normal.

Course in Hospital. Relief was obtained with physical therapy and he was discharged on the 25th day.

SIXTH ADMISSION

Fourteen months later he was readmitted because of hemoptysis of about 10 ml, which had occurred a few hours previously. The right leg had been swollen for three weeks. A diagnosis of pulmonary infarction was entertained. Skin bullae had appeared during the past six months and spread to involve the entire body.

Physical Examination. The heart and lungs were normal. The blood pressure was 180/110 mm Hg. There was mild edema of the right leg without tenderness. Multiple large bullae were observed over the entire body.

Laboratory Studies. The urine gave a 3-plus test for albumin and showed a few red blood cells. Hemoglobin was 10.6 g per 100 ml. A chest roentgenogram revealed an infiltrate in the right apex. Sputa studies for acid-fast bacilli and tuberculin tests were negative. An electrocardiogram was normal.

Course in Hospital. Follow-up chest roentgenograms showed complete clearing. The skin lesions were mildly improved. Cortisone was discontinued because of the possibility of tuberculosis. After an uneventful course he was discharged on the 33d day.

FINAL ADMISSION

Two months later he was readmitted because the bullous skin lesions had become unmanageable.

Physical Examination. Skin bullae of various sizes were present over the entire body. The heart and lungs were normal. The blood pressure was 160/100 mm Hg.

Laboratory Studies. The urine revealed a specific gravity of 1.014, gave a 3-plus test for albumin, and showed a few red blood cells. Hemoglobin was 10.4 g per 100 ml. The white blood cell count and differential counts were normal. Blood urea nitrogen was 27 mg per 100 ml. The serologic test for syphilis was negative. An examination of the peripheral blood for lupus erythematosus cells was negative.

Course in Hospital. There was no significant change until the 32d day when paralysis of the right upper extremity developed. In a few days he became semicomatose. This was followed by acute pulmonary edema and death on the 41st day of hospitalization, approximately five years after the onset of symptoms.

DISCUSSION

Doctor Powell: In summary, this middle-aged white man had a prolonged illness of five years' duration. It began with mild joint symptoms

which progressed to crippling, multijoint deformity. During the long course, marked weight loss occurred, and in sequence he developed duodenal ulceration, evidence of renal damage, hypertension, congestive heart failure, pulmonary infarction, a generalized bullous dermatitis and, terminally, hemiplegia followed by pulmonary edema.

When one is presented with such a patient whose disease involves nearly all of the major body systems, one either has to make several diagnoses or has to select one diagnosis that will offer a satisfactory explanation for the many manifestations. The latter, when possible, is of course preferable.

If we are to explain all the findings on the basis of a single diagnosis, such widespread involvement as evidenced in this patient appears to force us to look to the group of collagen diseases for an answer. Usually recognized as members of this group are: serum sickness, rheumatic fever, scleroderma, dermatomyositis, rheumatoid arthritis and its variants, periarteritis nodosa, and disseminated lupus erythematosus.[1]

Of this group only the last three named—rheumatoid arthritis, periarteritis nodosa, and disseminated lupus erythematosus—appear to be worthy of consideration in the differential diagnosis of this particular case. These diseases have many features in common that were manifest in this patient. They include: a chronic, relapsing, general long course; extreme weight loss and weakness; arthritis; vascular disturbances; cardiac, pulmonary, muscular, and renal lesions; rheumatoid nodules; increased sedimentation rate; increase in serum globulin; and decrease in albumin.[1]

As far as rheumatoid arthritis is concerned, this patient certainly developed the characteristic joint changes and subcutaneous nodules of this disease, and for the first few years these local manifestations typically overshadowed the systemic manifestations; however, the development of predominant systemic manifestations later renders a diagnosis of rheumatoid arthritis, per se, almost untenable. Some of the changes—to wit, albuminuria, renal insufficiency, and myocardial failure—could be explained on the basis of amyloidosis which occasionally occurs in late cases of rheumatoid arthritis.[1] Amyloidosis was supported in this case by a positive Congo red test, which I hasten to add is often misleading. Although secondary amyloidosis may have been present, I doubt that it was important, and I certainly do not feel that it explains all the features evidenced by this particular case.

The second possibility is periarteritis nodosa. The fundamental lesions in this disease involve the medium- and small-sized blood vessels, the lumina of which are reduced in size and may be obliterated. Thrombosis, partial healing with cicatrization, aneurysmal dilatation, rupture, and hemorrhage may occur. As would be expected, the clinical manifestations vary depending upon the number, site, and degree of

arterial occlusions. For instance, infarctions in the heart may lead to myocardial failure. Infarctions in the kidney may cause hematuria and hypertension. Occlusion of the cerebral vessels may cause hemiplegia. Thus, symptoms referable to any part of the body may occur, according to the vessels involved. Albuminuria, hypertension, duodenal ulceration, pulmonary infarction, and hemiplegia—all would have been consistent with the diagnosis of periarteritis nodosa. However, against this entity are (1) the presence of severe arthritic involvement; (2) absence of peripheral neuritis, which Mowrey and Lundberg[2] reported as occurring in about 42 per cent of the 607 cases of periarteritis nodosa they reviewed; (3) absence of a leukocytosis, evident in about 72 per cent of the same series; (4) absence of marked eosinophilia, observed in 18 per cent; (5) absence of fever, present in 68 per cent of this group; and (6) absence of characteristic pulmonary infiltration often seen in periarteritis nodosa.

The remaining collagen disease worthy of consideration is disseminated lupus erythematosus. Like periarteritis nodosa, it is characterized by widespread involvement and symptoms referable to most of the major body systems. According to Klemperer,[3] the fundamental pathologic lesion in this disease is fibrinoid metamorphosis of the extracellular portion, the collagen fibers, and ground substance of the connective tissues. The connective tissue matrix of the vasculature is often involved, producing endothelial proliferation and occlusion. For this reason the clinical picture may superficially resemble that of periarteritis nodosa.

According to Dubois,[4] the clinical picture of disseminated lupus erythematosus may be outlined as follows: "1. Signs of catabolism: fever, weight loss, emaciation. 2. Connective tissue lesions: rheumatoid arthritis, subcutaneous nodules, pericarditis, Libman-Sacks syndrome with myocarditis, pleurisy, polyserositis. 3. Vascular lesions: skin, central nervous system, ocular fundi, kidney, gastro-intestinal tract, adenopathy, splenomegaly, Raynaud's phenomenon, hyperpigmentation. 4. Hematologic changes: leukopenia, anemia (usually hemolytic), thrombocytopenia, increased circulating anticoagulant, false positive serologic test for syphilis, L.E. cells." This patient demonstrated many of the foregoing features. He had extreme weight loss; emaciation; rheumatoid arthritis; subcutaneous nodules; skin lesions; evidence of central nervous system, gastro-intestinal, renal, and cardiac involvement; anemia; and thrombocytopenia. However, such common manifestations as fever, present in 97 per cent of Dubois' cases; pleurisy, with an incidence of 59.5 per cent; polyserositis, observed in 55 per cent; leukopenia, evident in 68 per cent; false serologic tests for syphilis, reported in 32.6 per cent; and positive tests for L.E. cells noted in 86.5 per cent of Dubois' cases were lacking in this patient.

Although one would like to have all these findings as insurance in order to make a diagnosis of lupus erythematosus, it would be expecting

almost too much in this disease, which is so variable in its clinical findings. If the L.E. cell test had been positive I would feel quite sure of the diagnosis, because many, including Dubois, feel that a positive L.E. cell test is almost pathognomonic of this disease. It is therefore regretted that no more than one search for these cells was made.

I certainly feel there is ample evidence to indicate that this patient had one of the collagen diseases. As pointed out, the choice appears to lie between periarteritis nodosa and disseminated lupus erythematosus. If the joint findings had been less prominent, the skin lesions had not developed, and repeated blood and marrow examinations for L.E. cells had been made with negative results, I probably would have considered the diagnosis of periarteritis nodosa more seriously. However, it is my impression that the clinical picture presented by this patient is far more characteristic of disseminated lupus erythematosus.

Doctor Crampton:* I really have very little to add to the complete and thorough discussion by Doctor Powell. We have a patient who came in with what seemed like a typical rheumatoid arthritis with multiple joint involvement, and who proceeded to pursue a progressively downhill course over a period of five years that ended in death. This in itself is unusual for rheumatoid arthritis and leads us to suspect other underlying pathologic conditions. Significant events in his course include the administration of gold therapy, which was followed by the development of a dermatitis. The chart does not reveal the exact nature of the dermatitis which the patient had at that time. Subsequently, massive albuminuria appeared, which in turn was followed by the appearance of cellular elements and granular and cellular casts in the urine. In other words, this patient developed definite renal disease involving the glomeruli; massive albuminuria alone we might explain on the basis of secondary amyloidosis. Further indication in this direction is the disappearance of Congo red from the blood stream when that test was performed. Then follows involvement of a number of other systems, manifested by heart failure, anemia, cerebrovascular accident, development of bullous skin lesions, moderate hypertension, and renal failure. Certainly amyloidosis alone cannot explain all of these phenomena, nor can the appearance of moderate hypertension.

The one disease that characteristically produces involvement of all the systems affected in this case is lupus erythematosus disseminatus. The presence of a picture stimulating rheumatoid arthritis and followed by the urinary findings of glomerulonephritis, then the appearance of disease processes in many systems of the body, is characteristic of this disease. Not at all infrequent is the appearance of disseminated lupus in association with gold therapy of rheumatoid arthritis. The appearance of the bullous skin lesions clinches the diagnosis. Bullous skin lesions, not unlike those seen in pemphigus, have been reported

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in disseminated lupus and their presence with the other manifestations of disseminated lupus constitute the picture that we term the Senear-Usher syndrome.

My final diagnosis is without qualification, therefore: lupus erythematosus disseminatus with the Senear-Usher syndrome. In addition, in all probability, this man should have some evidence of Libman-Sacks' disease.

Doctor Throm:* In considering the differential diagnosis of this involved case, it is difficult to find a single diagnosis that will satisfy. For a long time prior to the terminal state it was apparent that this man had typical severe and extensive lesions of rheumatoid arthritis, and that his urinalyses routinely showed chronic nephritic changes. Then he began to show bullous lesions of the skin, which developed with increasing frequency and severity. These bullae were of variable size (some large but scarcely massive), arose out of apparently normal skin, and exhibited a tendency to clustering although distributed generally except for the palms and soles. The Nikolsky sign was positive, and the lesions could not be distinguished clinically from those of pemphigus vulgaris. But in the final days before the patient died there was very little bullous activity in the skin, which became practically asymptomatic. Only on one occasion was a small hemorrhagic vesicle noted in the mouth, and again a single, thin bulla appeared transiently on the lower lip. The patient was not of Hebrew descent. I feel confident that this man did not have pemphigus.

Clinically, the skin lesions looked like dermatitis herpetiformis also, but the patient was given adequate trial of sulfapyridine without effect. The bullae did not manifest the hemorrhagic quality commonly seen in polyarteritis nodosa.

After the appearance of the bullae some clinicians suspected that the patient suffered from disseminated lupus erythematosus (and indeed the skin lesions were compatible with this diagnosis), but they were unable to prove it because of the absence of some manifestations generally found in such cases, as already noted by the previous discussors. Besides, the condition is rare in males and in this age group.

That the patient had a toxic bullous dermatosis there can be no doubt, but I incline to regard the cutaneous manifestations as erythema multiforme secondary to active kidney, liver, and joint disease. My final diagnosis in this case was: Erythema bullosum pemphigoides, secondary to severe rheumatoid arthritis and chronic nephritis.

Dr. Powell's diagnosis:
Disseminated lupus erythematosus

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*Lt. Col. Urban L. Throm, MC, USA, Chief, Outpatient Service and Dermatology Service.

Dr. Crampton's diagnosis:

Disseminated lupus erythematosus (with the Senear-Usher syndrome and probable verrucous endocarditis)

Dr. Throm's diagnoses:

1. Rheumatoid arthritis, severe
2. Chronic nephritis
3. Erythema bullosum pemphigoides (secondary)

PATHOLOGIC FINDINGS

Doctor Glaser:* Significant gross findings at the post-mortem examination are as follows: A gluteal abscess with about 1,000 ml of fluid pus was noted. The pericardial sac contained about 500 ml of fluid. The epicardial surface of the heart was covered by a fibrinous exudate. The heart weighed 650 grams. The aorta, renal vessels, and cerebral vessels were noted as showing only minimal to mild atherosclerotic changes. The right and left lungs weighed 1,250 and 700 grams respectively. Sectioning revealed a considerable amount of brown fluid, especially in dependent portions. The spleen and liver weighed 350 and 2,300 grams respectively. Their descriptions are consistent with chronic congestive changes. The right wrist and both knee joints were examined, and roughening and erosion of articulating surfaces and some replacement of cartilage by fibrous tissue were found.

The microscopic examination confirmed the myocardial hypertrophy as well as congestive changes in lungs, liver, and spleen. Acute pulmonary edema was extensive. Acute fibrinous pericarditis, with a much more chronic process in which there was much fibrous connective tissue and little remaining panniculus cordis, was seen in the heart. The bone showed an advanced degree of osteoporosis. Articular surfaces showed much replacement of cartilage by fibrous connective tissue, and some active inflammatory infiltration. The kidneys contained glomeruli in which capillary membranes showed focal thickening (fig. 1). We consider these to be "wire loops" in glomerular tufts. Small arterioles showed an advanced degree of thickening of their walls (fig. 2). This was a hyaline eosinophilic material. Associated with these lesions were areas of ischemic change of kidney tissue including complete fibrosis of glomeruli. We also found small vessels in the tunica albuginea of the testis and in the adrenal gland with similar changes. Small splenic vessels also contained suggestive changes. At this point in our examination we again searched the L.E. cell preparations (made about a month before death). We were somewhat chagrined but also somewhat relieved to find a very few but typical L.E. cells (fig. 3). These smears also showed clumping of white blood cells in the "rosette" formations which are said to be found in lupus erythematosus. The skin lesions were examined carefully and the subcutaneous con-

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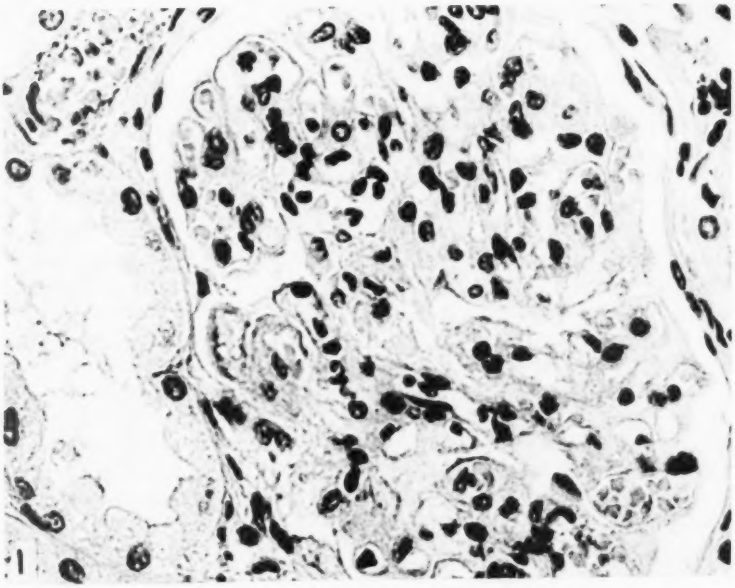

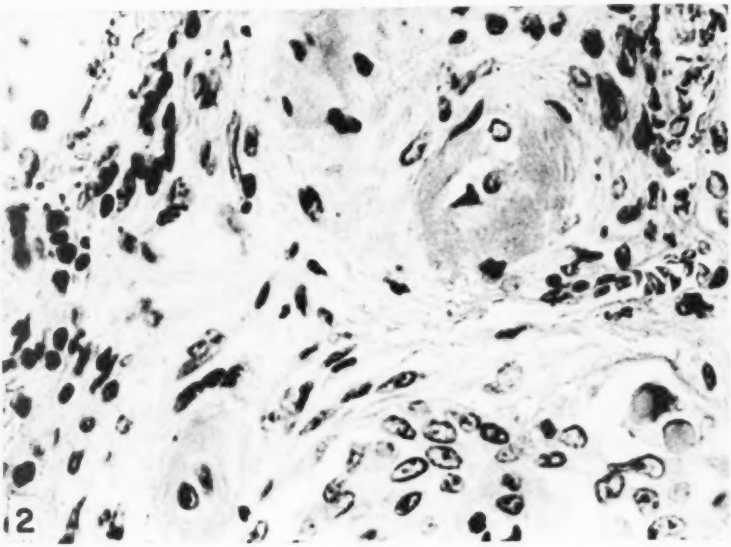

Figure 1. Thickening of capillary walls in glomerular loops. (× 530)

Figure 2. Occlusive changes in renal arterioles. (× 530)

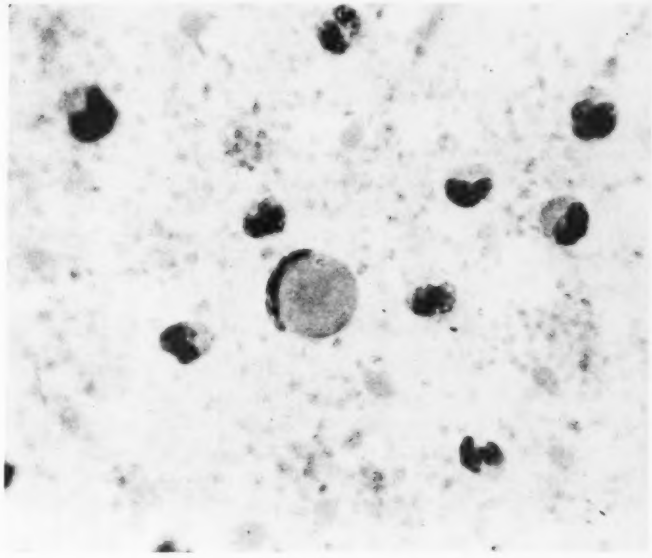

Figure 3. L.E. cell in peripheral blood obtained about one month before the patient's death. (× 675)

nective tissues contained areas of fibrinoid change. In other respects these lesions resembled pemphigus vulgaris. Fibrinoid changes were found in peri-aortic connective tissues and in synovial tissues as well. In areas of pericardial fibrosis, fibrinoid material was observed. The adrenals showed almost complete loss of cortical lipid and some increase of interstitial connective tissues. Arteriosclerosis of any common variety was exceptionally mild, although there were mild atherosclerotic changes in the aorta and intimal thickening of some of the arteries.

Pathologic diagnosis:

Disseminated lupus erythematosus with Senear-Usher syndrome

Doctor Glaser: I would like to hear comment on such experience as is known concerning the Congo red test in rheumatoid arthritis or lupus erythematosus. I would also like to inquire about the terminal localized paralysis for which we found no explanation.

Doctor Powell: As I mentioned in my discussion the Congo red test is very often misleading; so much so that it is not used as frequently at the present time as it has been in the past. It must be interpreted in the light of other evidence of amyloidosis.

I think the question of the patient's terminal hemiplegia is fairly easily answered. Because of multiple vascular lesions, vascular acci-

dents may occur in any part of the body. Fibrinoid thickening of the intima often results in thrombosis. Another possibility, of course, is actual rupture of the vessels with hemorrhage which does occur on occasion. Hemiplegia due to involvement of the cerebral vessels is common in this disease.

Doctor Throm: I have one comment with regard to the question of hemiplegia. In retrospect, this was not the typical thing seen after a cerebral vascular accident. It started first with the hand and moved proximally. Over the course of several days it could be seen to progress. It would seem as though it might fit in with a progressive obliterative type of arteritis.

Doctor Stokes:* Was there anything unusual about the gluteal abscess?

Doctor Throm: I don't think I can answer that. It couldn't have been related to the skin lesions. This man exhibited the most massive Nikolsky sign I have ever seen; he had these bullous lesions up to the size of a nickel widely scattered over his back, and when he twisted in bed one night the epidermis over the entire area stuck to the sheet, resulting in a circular pattern of slippage on the underlying corium.

Doctor Bergman:** I would like to know what is the causal relationship, if any, between rheumatoid arthritis and lupus erythematosus.

Doctor Glaser: Practically all patients with disseminated lupus erythematosus have, at some time or other, more or less severe joint symptoms. I believe I am right in stating that it is impossible to differentiate between this type of arthritis and rheumatoid arthritis. They are certainly closely related diseases, and one might wonder whether they are the same disease.

Doctor Crampton: I would like to say that the collagen diseases are basically the same disease, the evidence for this being really pretty good. They all have a common cause; they are all bizarre, allergic responses on the part of certain tissues of the body. From the standpoint both of the production of these diseases experimentally, and of the relief of their manifestations by a medicine that prevents these allergic (and finally degenerative) responses, namely, cortisone or ACTH, the evidence indicates that there is a common causative factor. In each of the collagen diseases a different tissue or group of tissues is involved in this fundamental pathologic process.

However, it is never justified clinically to say, for example: "Since they are all one disease, segregation into separate entities is useless and impossible." From the standpoint of prognosis and therapy, separation of these diseases is distinctly worthwhile.

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**Lt. Col. Philip A. Bergman, MC, USA, Chief, Department of Surgery.

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THE DERMATOLOGIST

"As the cynic has said, there are two sorts of general practitioner—the first sort knows no dermatology and regrets it, the second knows no dermatology and boasts about it. Often, indeed, the only dermatological literature the student or practitioner ever reads is what he receives free from the advertisers. I would urge him to think on these things and consider some of the simple remedies. In Whitfield's hands they worked; he prescribed them with dignity, with authority, and with confidence, understanding the whole patient and his disease. These qualities all can strive to acquire; add to them a knowledge of a few simple remedies and what they can do, and an awareness that blondes are dangerous, and you will succeed in treating skin diseases, as well as, if not quite with the happy self-confidence of, an old general practitioner friend of mine who says he can diagnose no skin disease but can treat them all."

—DAVID I. WILLIAMS, M. B., F. R. C. P.
in *British Medical Journal*
p. 455, Aug. 20, 1955

SERVICE ARTICLES

INTESTINAL PARASITE SURVEY OF KOREAN PRISONER-OF-WAR CAMP

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IN May 1951, a Joint Dysentery Unit was established on the island of Koje, south of Pusan, to study enteric infections among the North Korean prisoners of war. As a part of this investigation, fecal specimens were collected for a survey of parasitic infections in persons housed in the prison compounds. The specimens were collected from prisoners who were not known to have clinical manifestations of disease. The primary purpose of this survey was to obtain an estimate of the amebiasis problem in the various compounds, for possible epidemiologic consideration. The diagnosis and treatment of clinical cases of amebiasis have been reported elsewhere.[1]

METHODS

Collection and Preservation of Fecal Specimens. Arrangements for the survey were made with the medical officer-in-charge of the compounds. There were 20 compounds in the camp, each containing from 6,000 to 10,000 persons, housed 50 to a tent. A time was set for collecting specimens, and the compound commander was given specific instructions on the procedure for selecting persons to be examined. The physician in charge of each compound dispensary was asked to assist in making arrangements for collecting specimens. These physicians were prisoners and, in many instances, understood and could speak English. A South Korean physician who worked in the parasitology laboratory of

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This report concerns one phase of investigations conducted in Korea by a Joint Dysentery Unit sponsored by the Commission on Enteric Infections of the Armed Forces Epidemiological Board. The personnel who participated came from Walter Reed Army Institute of Research, Fleet Epidemic Disease Control Unit No. 1, National Microbiological Institute and Communicable Disease Center of U. S. Public Health Service, 406th Medical General Laboratory, 64th Field Hospital, Bureau of Laboratories of Florida State Board of Health, and Louisiana State University School of Medicine. Drs. Brooke and Payne came from the Communicable Disease Center, Drs. Swartzwelder and Frye from Louisiana State University School of Medicine, and Dr. Weinstein from the National Microbiological Institute. Dr. Brooke is now at Communicable Disease Center, Laboratory Branch, P. O. Box 185, Chamblee, Ga.

the Joint Dysentery Unit was present when the arrangements were made in order to ensure that the instructions were understood.

During the late afternoon, pasteboard containers were taken to the compound and a team was organized to obtain from three to five specimens from as many different tents as possible. An attempt was made to collect specimens from about 125 persons well distributed among the tents of each compound.

Early the following morning, stools were collected under supervision and brought to the compound dispensary. Only one stool specimen was collected from each person. In order to make it possible to detect and identify all types and stages of parasites, a two-vial method for preserving specimens was used.[2] About five-milliliter portions of each specimen were placed in two separate screw-capped glass vials, one containing 10 per cent formalin and the other polyvinyl alcohol (PVA) fixative. The fecal specimen was mixed well in each container with applicator sticks. Because the majority of specimens were soft, it was not difficult to get an adequate portion into each vial. After all specimens were collected, the vials were returned to the laboratory where additional formalin or polyvinyl alcohol fixative was added; the caps were secured with adhesive tape and the specimens were packed carefully for shipment to the United States.

Specimens from prisoners in 18 compounds were examined at the Louisiana State University School of Medicine and from those in two other compounds were examined at the Communicable Disease Center of the U. S. Public Health Service. The same technics were used in both laboratories after a joint period of instruction for the technicians.

EXAMINATION OF SPECIMENS

Formalin-Ether Technic. Specimens preserved in 10 per cent formalin were concentrated by the formalin-ether sedimentation technic for the recovery of protozoan cysts and helminth eggs. The technic used was essentially the same as that described by Ritchie[3] for fresh specimens. Unstained and iodine-stained wet mounts were prepared from the concentrated sediments and examined microscopically.

Polyvinyl Alcohol Fixative Technic. Films prepared on slides from specimens preserved in polyvinyl alcohol fixative were thoroughly dried, and then stained by the Heidenhain iron hematoxylin procedure. The polyvinyl alcohol fixative technic is designed primarily for the preservation and shipment of stool specimens containing amebic trophozoites.[2] Stained films were examined under oil immersion objective for a minimum of 10 minutes each.

RESULTS

A total of 1,870 specimens were collected, 1,726 being suitable for examination. Of those examined, 1,682 or 97.5 per cent were positive for intestinal parasites (table 1). Seven species of intestinal protozoa were identified. Five species of amebas were found. *Entamoeba coli* was observed most frequently (42.9 per cent), *Entamoeba histolytica* next (33.9 per cent), and *Dientamoeba fragilis* least often (four cases). *Giardia lamblia* was identified in 6.9 per cent of the specimens, and *Chilomastix mesnili* in 2.0 per cent. Several unidentified amebas and flagellates were observed but they are not recorded in the table.

TABLE 1. *Prevalence of intestinal parasites*

Parasites	1,726 North Korean prisoners of war		919 South Korean civilians*
	Number positive	Per cent positive	Per cent positive
Protozoa: **			
Entamoeba histolytica	585	33.9	5.0
Entamoeba coli	741	42.9	27.1
Endolimax nana	552	32.0	8.3
Iodamoeba bütschlii	177	10.3	0.8
Dientamoeba fragilis	4	0.2	–
Giardia lamblia	119	6.9	3.5
Chilomastix mesnili	34	2.0	1.1
Helminths:			
Ascaris lumbricoides	1,404	81.3	82.4
Trichuris trichiura	1,344	77.9	81.1
Hookworm	634	36.7	46.5
Trichostrongylus sp.	17	1.0	23.6
Strongyloides stercoralis	9	0.5	0.1
Taenia sp.	29	1.7	–
Diphyllobothrium sp.	1	0.05	–
Clonorchis sinensis	50	2.9	7.1
Paragonimus westermani	17	1.0	0.9
Fasciolopsis buski or Fasciola hepatica	6	0.3	–
Total persons infected	1,682	97.5	94.5

*Figures from table 6, p. 9, of reference 10.
**Unidentified protozoa are not recorded.

Six species of helminths were identified. The species most frequently encountered was *Ascaris lumbricoides* (81.3 per cent) and the helminth least frequently observed was *Diphyllobothrium*

sp. (one case). The hookworms, *Trichostrongylus, Taenia,* and *Diphyllobothrium* present were not identified to species because only the eggs were available. Likewise, no attempt was made to differentiate between eggs of *Fasciolopsis buski* and those of *Fasciola hepatica* although it is probable that those found represented the former species.

A comparison of the effectiveness of the formalin-ether concentration technic and the polyvinyl alcohol fixative technic in detecting amebic infections is presented in table 2. The polyvinyl alcohol fixative technic revealed higher percentages of *E. histolytica, Endolimax nana,* and *Iodamoeba bütschlii* than the formalin-ether concentration technic, while the reverse was true for *E. coli.* With all four organisms, the combined use of both technics increased the number of positive findings. Most of the helminth infections were detected by the formalin-ether technic.

TABLE 2. *Formalin-ether and polyvinyl alcohol fixative technics in detecting infections with four species of amebas in 1,726 stool specimens*

Amebae	Total number identified	Positive by formalin-ether technic		Positive by polyvinyl alcohol fixative technic	
		Number	Per cent of total	Number	Per cent of total
Entamoeba histolytica	585	407	70	511	87
Entamoeba coli	741	649	88	536	72
Endolimax nana	552	302	55	474	86
Iodamoeba bütschlii	177	97	55	150	85

DISCUSSION

During the seven months of investigation by the Joint Dysentery Unit, about 650 cases of amebic dysentery were diagnosed on sigmoidoscopic examination.[1] In view of this number of recognized cases and the numerous others which probably occurred, there is little wonder that the present survey revealed 33.9 per cent of the prisoners of war positive for *E. histolytica.* An attempt was made to correlate for each of the 20 compounds the number of observed cases of amebic dysentery and the prevalence rates of *E. histolytica* as revealed by this survey. Although the incompleteness of the data did not permit strict comparisons to be made, there appeared to be little or no correlation between the two. Higher prevalence rates of *E. histolytica* infections have been reported in the literature with much less associated amebic dysentery or even milder symptomatic cases of amebiasis. For

example, Reardon[4] found 42 per cent of the patients in a mental institution in Georgia infected with *E. histolytica,* but observed no clinical amebiasis. It is only possible to speculate on why there were numerous cases of amebic dysentery in the prisoner-of-war camps. Although the presence of more virulent strains of *E. histolytica* cannot be disregarded, it would appear, as suggested by Westphal,[5] Nauss and Rappaport,[6] and Blumenthal and co-workers,[7] that the trauma to the intestinal mucosa from frequent bacterial infections may have been responsible for many of the cases on Koje Island. During the seven-month investigation, over 1,400 cases of acute shigellosis were diagnosed in the prison hospital[8] and many other gastro-intestinal disturbances remained undiagnosed. Numerous cases of simultaneous shigellosis and amebiasis were observed. Furthermore, there is a possibility that milder infections with bacteria may have played a role in predisposing the mucosa to invasion by *E. histolytica.*

Hunter and co-workers[9,10] reported on intestinal parasite surveys of civilian populations in Korea. Although rates for helminths in the civilian and prisoner-of-war surveys are remarkably similar (*Trichostrongylus* sp. and *Clonorchis sinensis* excepted), those for protozoa are much higher among the prisoners of war (table 1). For example, 5 per cent of the Korean civilians and 33 per cent of the prisoners of war were found infected with *E. histolytica.* In part, this difference is due to the technics used. In both surveys, one specimen per person was collected and examined by the formalin-ether concentration technic. However, the present study included, in addition, the examination of stained films prepared from specimens preserved in polyvinyl alcohol fixative. The remaining difference between the rates in civilians and prisoners of war probably reflects the effect of military combat and imprisonment. Hunter and co-workers[10] have suggested that the custom of drinking hot tea instead of water may be responsible for maintaining a low prevalence rate of *E. histolytica* in Korean civilians, the infective cysts being destroyed by heat. If this is the case, the inability of the prisoners of war to follow this custom may have contributed to the increased prevalence of *E. histolytica* and other protozoa.

The prevalence rates for the helminths in the prisoners of war are interesting because, in several instances, they are similar to those for the Korean civilians (table 1). The rates for *Ascaris lumbricoides* and *Trichuris trichiura* are practically identical. This would appear to indicate that during combat and imprisonment, fecal contamination of human origin had not been reduced for the prisoners of war. As a matter of fact, contamination probably had been more frequent, as evidenced by the increased preva-

lence of the protozoa. On the other hand, the lower rate for hookworm in the prisoners of war may have reflected a change in the mode of life for these Korean men. Because hookworm infection is acquired by penetration of larvae through the skin, the change from an essentially rural existence with close contact with soil to the military and prison life with greater utilization of shoes, probably reduced the re-exposure to this parasite.

The 10 per cent formalin and the polyvinyl alcohol fixative technics for preserving stool specimens are convenient and efficient in conducting surveys. With these preservatives, it is possible to collect specimens in one part of the world and to examine them in another several months later.

In conducting surveys for intestinal parasites, it is advisable to combine a concentration technic with a procedure which will recover trophozoites.[11] By examining the specimen preserved in formalin by the Ritchie formalin-ether concentration technic and the portion preserved in polyvinyl alcohol fixative by stained hematoxylin films, this objective is accomplished. The formalin-ether technic reveals helminth eggs and larvae, and protozoan cysts; the stained polyvinyl alcohol film allows detection of amebic trophozoites and, to a lesser degree, protozoan cysts. In the present study, the soft consistency of many of the stool specimens favored the presence of trophozoites rather than cysts. Although trophozoites were recovered by the formalin-ether technic, they could be identified reliably only with the polyvinyl alcohol fixative technic. These two technics supplement one another in the detection of amebic infections because each procedure permits identification of organisms missed by the other (table 2).

SUMMARY

During the summer of 1951, 1,726 Korean prisoners of war on the Island of Koje (Korea), were examined for intestinal parasites. Portions of a single, normally passed stool per person were preserved in two vials, one containing 10 per cent formalin and the other PVA-fixative. The formalin-ether sedimentation technic was performed on the first portion and a permanently stained film (iron hematoxylin) was prepared from the second. A total of 1,682 prisoners (97.5 per cent) were found to be infected with one or more species of protozoa or helminths. The prevalence rate for *E. histolytica* was 33.9 per cent.

The formalin and polyvinyl alcohol fixative technics for stool preservation, and the formalin-ether sedimentation and the permanently stained films for examination, constituted an efficient method of conducting surveys for intestinal parasitic infections.

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THE SOLDIER AND THE STATESMAN

The soldier is dependent upon the statesman not only for allocations of men and materials, but for the climate of international agreement in which he can successfully carry out his tasks . . . . The statesman and the soldier both necessarily depend for their effectiveness upon each other. The military man, within his specialized field, must keep in mind that he is called in only when other methods have failed. The statesman should remember always that the soldier's effectiveness in supporting any national policy is only as great as his capability.

—MATTHEW B. RIDGWAY, Gen., U. S. A.
in *Armed Forces Management*
pp. 26-27, Nov. 1954

PSYCHIATRIC PROBLEMS IN TROOPS IN KOREA DURING AND FOLLOWING COMBAT

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THE TERMINATION of hostilities in Korea on 27 July 1953 brought about an armistice wherein both signatories to the armistice agreement remained fully armed, poised, and capable of striking a telling blow should the agreement be abrogated by either side. By contrast, when the armistice between the Central Powers and Allies was signed in November 1918, the military potential of the Central Powers had been crushed and the agreement in effect was the surrender of a decimated, exhausted, and defeated foe. The stalemate as it existed and still exists on the Korean battleground necessitated both combatants maintaining a state of combat readiness, a constant alertness, and a high degree of training, discipline, physical fitness, morale, and logistic support.

In the excitement and emotional overlays generated in battle, the cohesive and supportive forces of direction, unity of purpose, loyalties to comrades, unit pride, self-esteem, and devotion to leaders make the self-denial, the exhaustion, the suffering, even the terrors of battle, more tolerable to the individual. These supports and buttresses to the ego, as engendered in the battle milieu, are minimal in the armistice situation which now confronts troops guarding the respective sides of the approximately four-mile-wide Demilitarized Zone that runs across the Korean peninsula. Troops assigned to the Military Armistice Commission from both combatant forces patrol the Demilitarized Zone to prevent violation of the armistice terms. But these are only token forces; the real protection of each side is vested in the bunkers, mine fields, barbed wire, guns, and soldiers who man the redoubts constructed on both sides of the no man's land of the Demilitarized Zone.

The American soldier spends two months on the line, then one month in reserve, and this pattern continues for the duration of his tour. His duties on the line alternate between one day up in the hills or mountains manning an outpost or observation sta-

Read at annual meeting of the American Psychiatric Association, Section on Military Psychiatry, 13 May 1955.

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tion, and the next day in the battalion area in a nearby valley, living under fairly comfortable field conditions. In reserve he lives in a rear area under camp conditions, but training, education, physical conditioning, care of clothing and equipment, and police and other camp activities are carried on. He has opportunities for sports, recreational activities, and some hobbies, but little opportunity for associating with the opposite sex until he becomes eligible for a one-week Rest and Rehabilitation visit to Japan after four to six months of service in Korea. Not until recently have the natives been permitted to return to their fields adjacent to the defense lines dominating the Demilitarized Zone.

It is the psychiatric experiences of these troops in the combat readiness stage while manning the ramparts covering the Demilitarized Zone that will be compared with those of the troops, in some cases the same troops, who fought bloody engagements in the same area before the armistice. It is significant that all the divisions on the line at the time the cease-fire occurred continued to operate in relatively their same positions in the combat line for up to a year in most cases and even longer in some instances. After the armistice was inaugurated, strengthening positions and guarding their various sectors of the line was the mission of these divisions.

ORGANIZATION AND OPERATIONS

The psychiatric operational organization of the postcombat period remained basically much the same as during the combat period. Of course, the tactical situation remained static, and did not require the urgent evacuations from forward echelons that often occurred in the ebb and flow of a battle. The forward stations, however, as in the combat period, were limited in their holding capacities as well as in treatment facilities. As in the later phases of World War II, the psychiatric organization in Korea was and continues to be in echelon. It followed the pattern with modifications and variations as set forth in Army directives in 1950[1] following the best thinking of those who were involved in the practice of combat psychiatry during World War II. Authors[2-5] who employed those ideas effectively in the organization and administration of neuropsychiatric facilities in the Korean campaign have reported their experiences.

World War II and, indeed, World War I demonstrated the paramount importance of and the crucial role played by the division psychiatrist in reducing the psychiatric noneffective and evacuation rate.[6] Whereas it took two years for the division psychiatrist to be reinstated and established in the World War II combat division, the 24th Infantry Division, which was the first on the scene of battle in the Korean campaign—its full complement having been flown or shipped by rail and water from Japan into

South Korea within 10 days of the outbreak of hostilities—had a division psychiatrist with it. Two other divisions joined the 24th within a fortnight after its arrival, but these two added divisions had no division psychiatrist with them. At the moment it was of no serious consequence, because little or no intradivisional psychiatric treatment was feasible in view of the continuing forced withdrawal and delaying tactics employed by the defending troops.[2] Within two months intradivisional psychiatric treatment was in full operation in the four Army divisions then in Korea, and was functioning in a highly effective manner. This transpired chiefly because the lessons learned in World War II had survived in a recognizable state through Army training circulars,[1] directives, consultants' conferences, and the inclusion of a psychiatrist in the Table of Organization of a combat division, even if in some cases the space was not filled during periods of garrison living.

The establishment of intradivisional psychiatry was quickly followed by Army and theater psychiatric operations, single channeled and in echelon, as the tactical situation stabilized. This permitted centralized and positive control of screening, treatment, and evacuation. The man who becomes a psychiatric casualty on the battlefield receives what might be called psychiatric first aid from his buddies, squad, platoon, and company leaders or from some combat veteran who has a certain ego-supporting relationship with the soldier. When unit supports are not efficacious, the soldier enters medical channels at the battalion aid station where definitive if simple treatment is afforded by the battalion surgeon or his assistants; 60 per cent or more of such men are returned to full duty. In this 60 per cent are included those treated on an excused-from-duty as well as outpatients-still-on-duty status. If further evacuation is necessary, the patient receives further evaluation and treatment at the division clearing station, the rear echelon of divisional treatment facilities.

Here treatment is under the direct supervision of the division psychiatrist. Up to 50 or 75 per cent of psychiatric casualties at this level would be expected to return to combat duty. Depending upon the tactical situation, of course, casualties would usually remain at the battalion aid station from 24 to 48 hours and at the clearing station for from 3 to 5 days. Those not considered salvageable for combat in the division areas within the time limits established by the policy of higher headquarters are then evacuated to the Army psychiatric treatment center operated at the evacuation hospital level and under the control of the Army surgeon. Those men not considered salvageable for combat duty normally would be further evacuated to convalescent hospitals in the Army area, where it is feasible to give more prolonged treatment; those requiring hospitalization would be evacuated

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to hospitals in the Communications Zone specializing in the treatment of neuropsychiatric diseases, or to general hospitals located there.

In Korea during combat, one augmented neuropsychiatric treatment center served not only the Eighth Army and the Tenth Corps, but also base installations and personnel supporting the troops on the battlefront. Paradoxically, psychiatric casualties were often evacuated forward, not only to the neuropsychiatric treatment center which had the only evacuation authority for neuropsychiatric cases from the area, but at times psychiatric casualties were also evacuated forward to the battalion aid station in the division area if they were found to be stragglers. This organizational and operations pattern continued after the armistice was signed and the cease-fire order was issued.

The neuropsychiatric treatment center which served Korea in the combat days has continued its operations in the postcombat period to the present. It has remained in the same location and the same rather crude housing facilities; these consist of tents, with quonset huts for the clinic and disturbed ward. It has retained the only evacuation authority for moving neuropsychiatric cases from Korea excepting cases considered as emergencies. It has received its evacuees from the division area in the same fashion as before, but without the pressures and threats of enemy attack affecting treatment regimens and the management of their cases. The policy of maintaining the environment of the psychiatric treatment facilities in both the Army and division areas as much like those of the patient's units as possible, which was so needed and beneficial during the combat period, was in essence carried over into the postcombat period for tactical as well as therapeutic reasons. The milieu, therefore, in which psychiatric patients were treated in the postcombat period remained basically unchanged from that of the combat period, except that the stresses as well as the supporting factors of the "fire fight" were missing.

COMPARATIVE STRESSES

In combat, fear is the dominant stimulus in producing emotional disabilities. Mounting casualties, lengthening duration of combat activity, military reverses, lack of motivation, poor indoctrination, unrecognizable goals, and lack of confidence in weapons and leaders all conspire to dissolve the "feelings of invulnerability" usually experienced by the soldier after his "baptism of fire," and to subject him to the insidious ravages of fear. Fear—of mutilation, death, capture, cowardice, failure to support his buddies, of being responsible for the death of a buddy, and of insanity—gnaws on the tense emotional strings which hold his personality in a tenuous equilibrium. Often visions of family

suffering caused by his death haunt the exhausted soldier. The Chinese, fully aware of the crippling psychologic and physiologic effects of fear, employed bugles, whistles, and cymbals to instill fear into their enemies as was done in ancient times by armies engaged in battle. In modern warfare air attack, artillery fire, and chemical warfare are the most potent producers of fear stimuli. The Chinese, lacking the fire power of their opponents, often used more primitive means of producing fear stimuli, often with deleterious effect. These are some of the external stresses which may produce the nervous breakdown in battle.

The terrors of battle are obvious in their potentialities for producing psychic trauma, but troops removed from the rigors and stresses of actual combat by the Korean armistice, and their replacements, continued to have psychiatric disabilities, sometimes approximating the rate sustained in combat, as in the psychoses. Other stresses relegated to the background or ignored in combat are reinforced in the postcombat period when time for meditation, rumination, and fantasy increases the cathexis caused by such stresses, thereby producing symptoms. Absence of gratifications, boredom, segregation from the opposite sex, monotony, apparently meaningless activity, lack of purpose, lessened chances for promotion, fears of a renewal of combat, and concern about one's chances in and fitness for combat are psychologic stresses that tend to recrudesce and to receive inappropriate emphasis in an Army in a position of stalemate.

Rotation policies create in some soldiers a feeling that the men in the Army are exploited in comparison with those in the other services; for example, Air Force personnel serve one year in Korea and marines 14 months, whereas the soldiers in the Army are obliged to serve 16-month tours in Korea. Many of their United Nations comrades are obligated to serve only one year in Korea even though they traveled farther to get to their overseas assignments.

Food, shelter, bathing facilities, sanitation, and recreation facilities, while much improved over those available in the combat period, are far below the standards to which the men were accustomed at home. Physical fitness, proficiency with weapons, and maintenance of equipment and weapons must be continuing preoccupations of a ready and alert armed force. Only too often maintaining a state of readiness appears to be a fruitless, aggravating, and irritating annoyance to many who do not understand or cannot accept its imperative necessity. In the combat situation the poorly motivated and indoctrinated are carried along by the necessity for group identification and communication, whereas the condition of combat readiness affords less cohesive sociologic forces.

Sympathy of the home folks with their men in battle often spares the soldier from the problems at home. The soldier in an occupation Army has no such immunity. Not only important issues but also the petty problems, annoyances, and frictions at home are relayed on to him. Distance often prevents the soldier from offering any specific action or help, and his frustration in this respect only serves to arouse his repressed hostilities. Domestic problems at home are often reflected in behavior problems in soldiers, particularly those of immature personality or with character defects. Minor inconveniences are often interpreted as discrimination or even persecution, an attitude that jeopardizes the soldier's adjustment in his group. Neurotic tendencies may progress to somatic reactions and the compulsive may show overt anxiety. Irritations that would be ignored by the soldier engulfed in the heat of battle may make a considerable impression on the soldier occupied with tedious, routine duties. Thus, the need for psychiatric assistance for troops manning the redoubts of a demilitarized zone in an uneasy truce may be almost as essential as in combat.

COMPARATIVE SUPPORTS

Unit morale is perhaps the greatest factor influencing the morale of the individual in combat. The factors influencing unit morale, though sometimes intangible, are sufficiently powerful to keep a considerable proportion of the troop well motivated.[7] Unit morale entails mutual support from buddies and willingness to sacrifice for them. It is a sustaining force or emotional bond engendered in individuals who share common dangers, hardships, and deprivations. All successful combat units possess it in its positive manifestation. It is the result of the strong group identification of its individual members. The loneliness, desolation, and treachery of the battlefield bring men closer, not only emotionally, but also for mutual protection, seemingly as a spontaneous reaction. The strong bonds of friendship formed and welded on the battlefield resemble the love found in a closely knit family group. Much of the self-love present in all of us under these conditions is displaced into concern for the group with a consequent reduction in anxiety regarding self and an increased tolerance for battle stress.

In battle, when a man's life might well depend upon the decision of even his immediate superior, leadership assumes an importance of a magnitude not found in the training camp or even in the unit guarding a demilitarized zone. The effects of leadership are so frequently apparent in the Army as to drive home the simple fact that if a leader meets the emotional needs of his men adequately they are greatly supported against personality disturbances.[8] As a father figure this leader is expected to sup-

ply a large portion of the emotional and physical needs of his men. By his personal concern for his men, his warmth and understanding, and his prestige position in the military social structure, he wins their co-operation, loyalty, respect, and affection, and is thereby enabled to enforce discipline of the group. Failure to establish himself as an authoritative figure prejudices his success as a leader. The discipline of a military unit is not the discipline of a prison, for in the former situation it is a sign of morale and conformance is spontaneous, while in the latter case discipline is hardly associated with a high state of morale. Discipline in the battle situation is recognized by the soldier as an essential for combat efficiency and a factor in his survival as well, so he can more easily submerge his individual desires for the common good.

If one considers the soldier's motivation to be his conscious attitude toward his assignment, one can readily see that combat circumstances arouse stronger motivating forces in troops than are likely to occur in an occupation or stand-by status. The atrocities committed by the enemy in the early days of the Korean campaign were common knowledge on the battlefront and tended to inculcate hatred of the enemy. This hatred served to reinforce positive motivation and to dull the effects of fear-producing stimuli. The attitude of the soldier in the Korean conflict toward the enemy was similar to that of the soldier who fought in the Pacific in World War II where hatred of the enemy was a powerful incentive to fight and endure hardship, deprivation, and suffering in order to wreak vengeance upon the foe. In the psychologic preparation of a soldier for battle, the indoctrination of hate is considered highly desirable but difficult to inculcate in the American soldier with his cultural background so different from the youth of many foreign lands. But the treachery and the cunning of the enemy in the Korean campaign and the atrocities they committed soon overcame the deeply ingrained inhibitions against hate. In this way, the inner defenses against anxiety of the soldier were reinforced.

No such forces are available to the soldier in the unit in a state of combat readiness guarding his side of the demilitarized zone. Nor are there opportunities for him to discharge his hostilities against those he holds responsible for his predicament, such as by firing his weapon at the enemy. While Marshall,[9] in his studies of soldiers in combat in World War II, found that only 15 to 25 percent of individual soldiers fired their weapons, there is little doubt that the opportunity to fire a weapon against an enemy can help relieve the tenseness built up in battle.

Morale, group identification, motivation, leadership, and attitudes all play a role in supporting the soldier and allaying the

effects of anxiety-producing stimuli. Incentives, orientation, religious faith, esteem, and affections probably play a lesser but nevertheless positive role in maintaining the equilibrium of the personality under stress. These factors are also operative in troops in an occupation or stand-by basis.

STATISTICAL ANALYSIS

Data studied have been extracted from monthly divisional and hospital reports. The statistics to be presented for the Korean operation were compiled from reports submitted directly from psychiatric facilities in field and hospital installations and were originally instituted to reflect psychiatric trends or problems developing in divisional or geographic areas of the combat zone.[4] Many cases recorded in official statistics are not of sufficient severity to warrant transferring the patients to a psychiatric facility; consequently these figures are not identical with official statistics of the Department of the Army. Rates are expressed as number of cases per 1,000 of troop strength per annum, both for security reasons and to maintain a constant baseline. Hanson and Ranson[10] devised such a reporting system in the Mediterranean Theater in World War II, and the reporting system for the divisions in Korea is a modification of their original plan.

An exception to this reporting method is the statistics obtained from Eighth Army Provost Marshal records for the year 1953, which show crimes of violence, narcotics violations, and suicides. They record only the major offense for which the arrest was made. Multiple offenses committed concurrently by the same individuals are not included.

Following cessation of hostilities, divisions moved their main line of resistance back about two miles in compliance with the terms of the cease-fire agreement. Geographic and climatic conditions would, therefore, not influence divisional rates from what they were in the first half of 1953, when the combat situation was rather stable except for constant patrol actions and localized vicious attacks by the enemy in an attempt to straighten out his lines prior to the signing of the armistice. It was not until near the end of the first year postcombat that Republic of Korea troops began replacing American divisions on the line.

It can be seen in figure 1 that the total incidence rate of 34 per 1,000 troop strength per annum for American divisions in Korea in the first half of 1953, which includes outpatients, compares exceptionally well with the incidence rates of American troops in Europe in World War II, which, for the period from June 1944 to May 1945, were reported as 101, 84, and 71 for the First, Third, and Fifth Armies respectively.[4] The World War II figures exclude neuropsychiatric outpatient treatment, which was practically nonexistent at that time.

Using in the first year postcombat the same evacuation criteria, channel and echelon system for evacuation, and treatment as were employed in Korea during combat, the psychiatric incidence total rate for divisions fell to 25.8 per 1,000 per annum. This drop of 24 per cent may have resulted from better screening in forward medical installations, from a reduction of stresses to which the men were subjected, or from a combination of both.

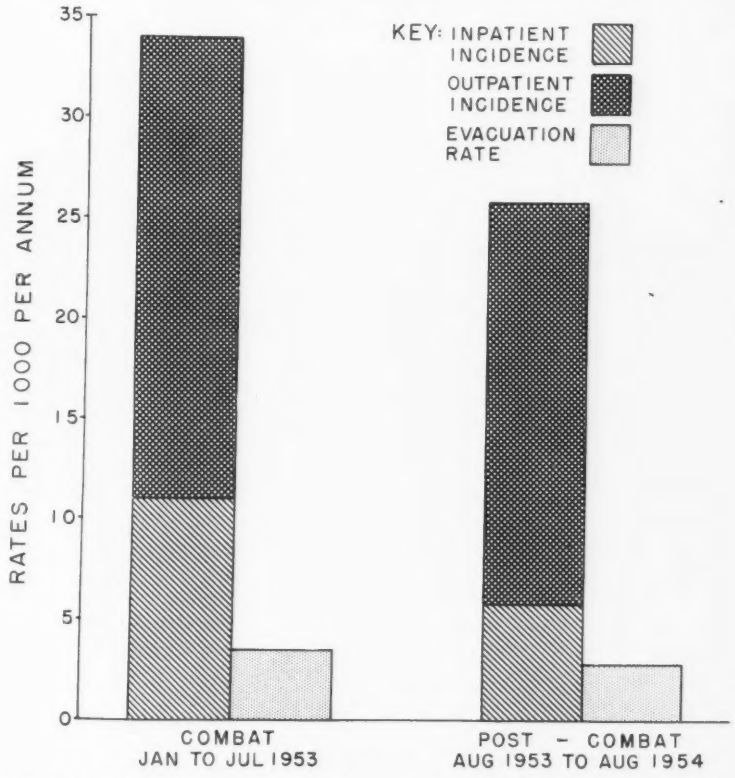

Figure 1. Psychiatric incidence and evacuation rates for divisions in Korea from January 1953 to August 1954 (cease fire—27 July 1953).

A logical conclusion is that both played some role. Less stress could produce not only fewer psychiatric syndromes but also less severe presenting symptoms; thus fewer patients would require referral to divisional psychiatric treatment facilities. It is to be noted that in the combat period 3.4 per 1,000 per annum of troops were evacuated from the division area for psychiatric conditions, as compared to 2.8 per 1,000 per annum evacuated in the postcombat period. Percentagewise the evacuation rate during the combat period was 21 per cent higher than the postcombat period.

Sixty-eight per cent of all patients reaching divisional psychiatric facilities in the combat period were treated as outpatients as compared with 77 per cent in the postcombat period.

Figure 2 is a graphic portrayal of the effects of battle on the production of severe psychiatric casualties requiring inpatient

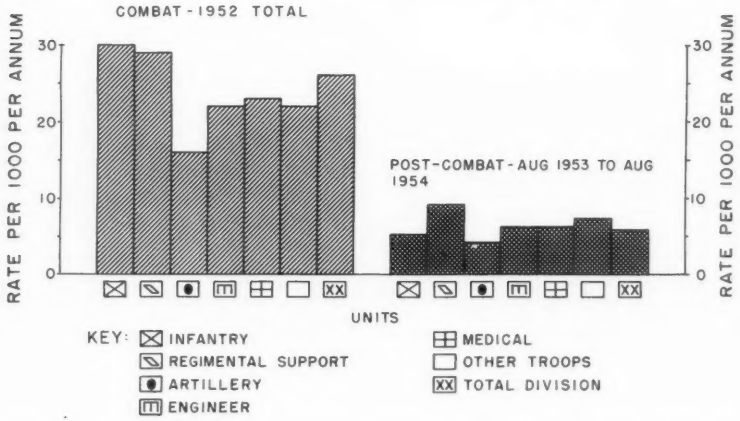

Figure 2. Comparison of psychiatric inpatient rates in divisional elements, U. S. Army, Korea, for combat and postcombat periods (cease fire—27 July 1953).

treatment. This reduction, as one would expect, is most sharply reflected in the infantry, which in battle is required to come to grips with the enemy. Artillery, engineer, and even medical troops, who are more exposed to enemy fire than are support and headquarters troops, also show a more marked reduction in incidence rates. These comparative rates reinforce the thesis that in spite of potent emotional supports for the personality in battle, the destructive forces of fear and anxiety generated in battle far outweigh the supports in potency and effects upon the ego structure.

The ratio of nonpsychotic to psychotic patients evacuated from a given military operation mirrors the efficacy of psychiatric effort in the zone, particularly with respect to the utilization by the military of neurotics and other nonpsychotic individuals with emotional problems. Figure 3 shows how the reversal of the ratio of nonpsychotic to psychotic evacuations, which began in 1951 when psychiatric operations became organized, integrated, and effective, continued into the postcombat period. At the same time, delaying, withdrawal military tactics ceased. Figures for the Mediterranean Theater in the first half of 1944 are given for comparison.

Figure 4 is a record of offenses—crimes of violence, narcotics violations, and suicides—committed by personnel of the Eighth Army in Korea in the calendar year 1953. Although the actual

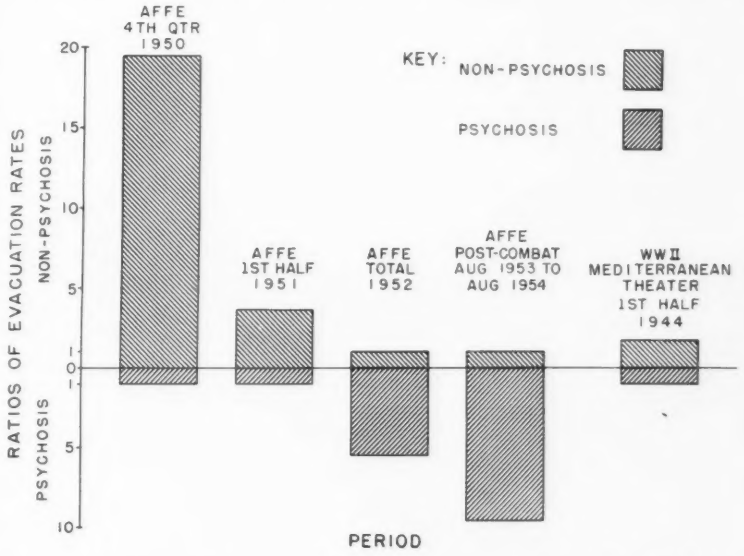

Figure 3. Comparison of ratios of psychiatric evacuation rates (psychosis vs. nonpsychosis) between Army Forces Far East, 1950-1954, and Mediterranean Theater, 1944.

OFFENSES		FIRST 6 MO. 1953	LAST 6 MO. 1953
CRIMES OF VIOLENCE	AGGRAVATED ASSAULT	82	80
	MURDER	35	9
	VOL. MANSLAUGHTER	3	5
	ROBBERY	6	10
	RAPE	9	7
NARCOTICS - POSSESSION OR USE		84	41
SUICIDE		16	17

Figure 4. Criminal offenses among Eighth U. S. Army personnel in Korea during 1953 (cease fire—27 July 1953).

cease-fire order became effective on 27 July 1953, the table nevertheless gives a fair comparison of offenses covering approximately a six months' period before and after the cease-fire order. One would surmise that crimes of violence might increase after the armistice when the men would not be able to release their hostilities by aggressive acts against the enemy, but this is not borne out by these statistics. In the postcombat period murders were about one fourth as common and arrests for narcotics violations were about one half as frequent as in the combat period.

SUMMARY

The armistice situation in Korea afforded a unique opportunity to compare the incidence and severity of psychiatric syndromes in combat troops with troops in a state of combat readiness. Climatic and geographic conditions under which troops lived did not change during the periods studied. Neither did evacuation criteria, methods, and therapeutic practices change essentially in any way.

Destructive and supporting psychologic factors affecting troops in combat and in a state of combat readiness were discussed, and statistics were presented which showed that the stresses of battle far outweighed the internal and external supports that the soldier could muster to counteract them. Battle stress was shown to directly affect psychiatric incidence, evacuation, and hospitalization rates, which were substantially increased during the combat period. Psychiatric incidence rates in divisions were approximately 25 per cent higher during combat. Murders were about four times more common and narcotics violations about twice as frequent in the combat period as in the postcombat period.

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Obstructive-like Jaundice Secondary to Chlorpromazine Therapy

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WILLIAM R. SHADISH, *Major, MC, USA*

CHLORPROMAZINE HYDROCHLORIDE (Thorazine hydrochloride) has become increasingly popular in the various fields of medicine. Its effectiveness has been noted in the control of acute and chronic states of psychotic excitement.[1-4] Intractable nausea and vomiting are often amenable to chlorpromazine therapy,[5] and its use in analgesic problems is well known.

Like most other pharmacologic substances the drug has some undesirable side effects. This case report is an example of one of the more serious complications—that of hepatocellular jaundice with obstructive-like findings during the administration of the drug. A major surgical procedure was undertaken because of inability to differentiate the condition from that of obstructive-type jaundice. As a result of knowledge gained from this case another patient with similar findings was saved from an unnecessary operation.

CASE REPORT

A 40-year-old woman was admitted to the neuropsychiatric service of this hospital with the diagnosis of manic-depressive psychosis. Physical examination was essentially normal. Chlorpromazine, given orally, was prescribed in a dosage of 25 mg every six hours. The dosage was changed to 50 mg three times daily for 17 days for a total of 2.5 grams. On the 15th day after initiation of chlorpromazine therapy, the patient developed a mild chill and symptoms of general malaise associated with a temperature of 104°F (oral). Repeated cellular examinations of the peripheral blood were normal and the sedimentation rate remained at approximately 30 mm/hr during the entire hospitalization. One hundred and eighty milligrams (300,000 units) of procaine penicillin were given intramuscularly daily. Within three days the patient's temperature was normal. On the 20th day she complained of epigastric distress, and two days later there was icteric discoloration of the scleras and skin. The serum bilirubin (total) was 7.8 mg per 100 ml at that time, and an examination of the urine was positive for bile. Her stools were a brownish-gray color, negative for bile, and positive for blood by the Guaiac test.

From Walter Reed Army Hospital, Washington, D. C.

Careful questioning of the patient and her relatives did not reveal any history of previous hepatic disease. No causative factor, such as recent transfusions of blood or plasma, could be blamed for the jaundice. There was no history of previous gall bladder disease. Roentgenographic studies made during the course of a previous examination had revealed a normally functioning gall bladder without calculi. The liver was palpable and nontender, one fingerbreadth below the costal margin. The gall bladder was not palpable. Her abdominal organs were easily palpable because of undernourishment. Because there was a possibility that the jaundice was caused by chlorpromazine, the drug was discontinued. A roentgenologic examination of the gastro-intestinal tract by means of barium by mouth and by enema was normal, as was an intravenous pyelogram. A needle biopsy of the liver showed evidence of bile stasis which was considered compatible with extrahepatic biliary obstruction (fig. 1). Neither the gall bladder nor bile ducts were visualized after Cholografin (brand of sodium lodipamide) was given intravenously. The dye was excreted by the kidneys, producing a normal pyelogram. Serial liver function tests revealed that the serum bilirubin

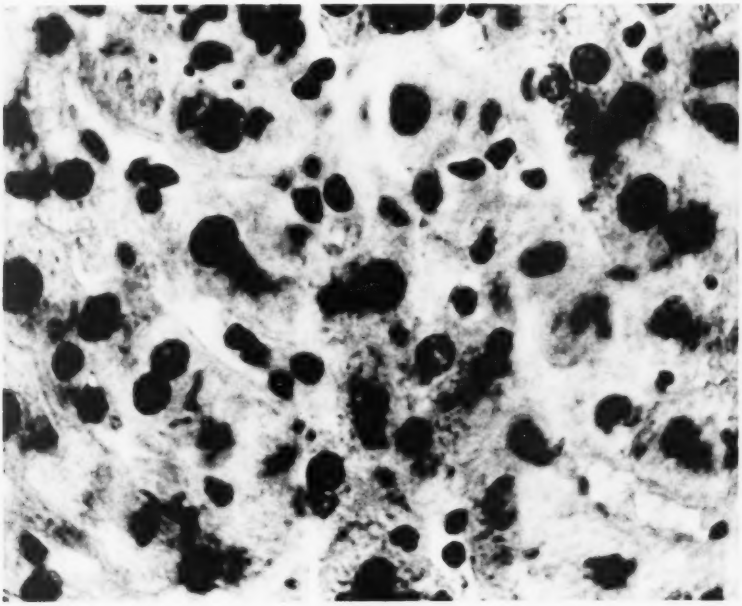

Figure 1. Preoperative liver biopsy specimen obtained with the Silverman needle. The picture is consistent with the pathologic changes seen in biliary obstruction. (× 625)

(total) rose to 14.2 mg per 100 ml and the alkaline phosphatase levels to 15.9 Bodansky units. The prothrombin time, cephalin-cholesterol flocculation, and thymol turbidity determinations remained normal. The

icteric tint of the scleras and skin was increasing. In view of these findings a clinical diagnosis of obstructive jaundice was considered.

Twenty-eight days after the onset of jaundice an exploratory laparotomy was performed. The gall bladder was small and collapsed. The liver was of a greenish color and slightly smaller than normal. The common bile duct was not distended, and palpation of the extrahepatic ducts, pancreas, and duodenum was normal. A choledochotomy, including exploration of the common bile duct and left and right hepatic ducts, revealed no abnormality. A cholangiogram at time of operation showed no evidence of extrahepatic biliary obstruction (fig. 2). A measurement of the bilirubin content of bile obtained from the duct at

Figure 2. Cholangiogram obtained during operation, 28 days following onset of jaundice. The gall bladder and biliary tree filled completely and showed no evidence of obstruction.

this time was 2.4 mg per 100 ml (normal values for bilirubin content of bile in the common duct vary between 17 and 71.4 mg). A duodenotomy was performed and a careful gross examination of the tissue in the region of the ampulla of Vater was normal. This was confirmed by a subsequent report on biopsy specimens. The duodenum was closed in

a transverse manner using two layers of fine sutures. A T-tube was placed in the common bile duct with the long arm being brought out through a stab wound in the right flank area. Prior to closure of the abdomen a large-size liver biopsy specimen was obtained.

Examination of the liver tissue obtained at operation revealed the normal lobular architecture to be preserved. There was marked bile stasis with bile thrombi in the central zone of the lobules, an occasional minute focus of liver cell necrosis in the midzone, a moderate degree of pleomorphism of liver cells, and a pericholangitis of moderate intensity. The bile ducts were empty and free of cellular exudate, bile thrombi, or any other foreign material. Their lumina were, in general, collapsed and there was no evidence of any undue bile duct epithelial hyperplasia or proliferation. The cellular infiltrate of the periportal fields was composed predominantly of mononuclear cells, histiocytes and lymphocytes, with an admixture of a small number of segmented leukocytes. These findings were considered as being consistent with the histopathologic picture as seen in jaundice due to chlorpromazine therapy (fig. 3).

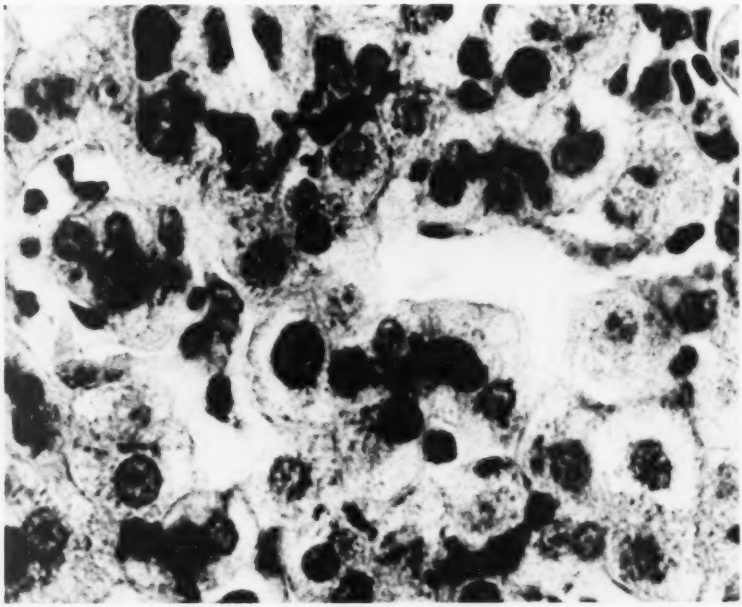

Figure 3. Liver biopsy specimen obtained during exploration on 28th day after onset of jaundice, showing on microscopic section the liver findings of central lobular bile stasis and bile thrombi. (× 625)

The patient's postoperative course was complicated by mild mental depression and weakness. Her improvement was gradual, and she was

discharged at the end of the fifth postoperative week (nine weeks after onset of jaundice). At this time the total serum bilirubin level was 1.9 mg per 100 ml and the direct van den Bergh was 1.1 mg per 100 ml. Bile obtained from the T-tube on the third postoperative day revealed a total bilirubin concentration of 2.1 mg per 100 ml. The T-tube was removed on the 28th postoperative day.

There was no recurrence of jaundice or symptoms of hepatic or biliary tract disease. Five months later the patient returned for repair of an incisional hernia. The liver edge, which was firm and nontender, was palpated as at the previous examination. She had gained about 10 pounds in weight. The total serum bilirubin level was 0.6 mg per 100 ml. The alkaline phosphatase level was 8.9 Bodansky units with a total protein of 6 g per 100 ml and an albumin-globulin ratio of 1.1. Both the cephalin-cholesterol flocculation and the sulfobromophthalein sodium excretion tests were normal. During repair of the incisional hernia a large wedge specimen for biopsy was obtained from the normally appearing liver. Occasional minute bile thrombi present in the central zone of the lobules and a slight periportal infiltrate composed of mononuclear cells were observed microscopically. It was interpreted as almost normal liver tissue (fig. 4).

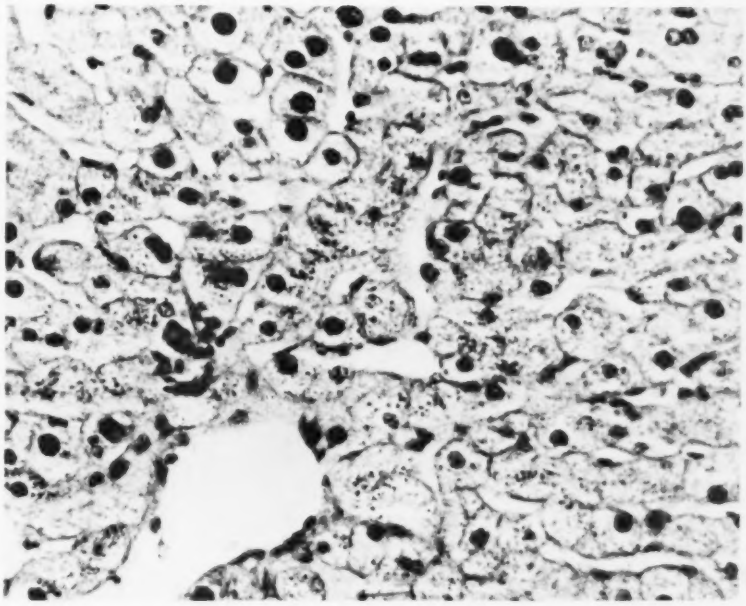

Figure 4. Liver specimen for biopsy obtained 7 months after the onset of the jaundice. Occasional minute bile thrombi are still present in the central zone of the lobules and there remained a slight periportal infiltrate composed of mononuclear cells. (× 240)

COMMENT

The incidence of jaundice following chlorpromazine administration is a relatively uncommon complication. There are reports of three patients having been operated on because of signs and symptoms of obstructive jaundice.[6-8] In table 1 the inconsistency of the low incidence of jaundice among the 500 cases reported by Moyer and associates[5] is shown. However, only 55 of their patients were given the drug for more than five days. In the majority of patients in whom jaundice was reported as a side effect, the icterus occurred within 14 to 21 days after initiation of therapy. It is notable that the dosage before onset of jaundice varies greatly, one of the patients reported by Loftus and associates[7] having received a total of only 400 mg. It is presumed that the incidence of jaundice due to chlorpromazine therapy over a prolonged period is from 1 to 4 per cent.

TABLE 1. *Incidence of jaundice during chlorpromazine therapy*

Authors	Total cases in series	Incidence of jaundice		Duration of therapy at onset of jaundice
		Number	Per cent	
Lehmann and Hanrahan[2]	71	3	4.2	2 weeks (case 1) 3 weeks (case 2) 4 weeks (case 3)
Winkelman[4]	142	3	2.1	2-5 weeks
Zatuchni and Miller[8]	Not stated	1	—	14 days
Van Ommen and Brown[6]	Not stated	3	—	3 weeks (case 1) 19 days (case 2) 21 days (case 3)
Moyer and associates[5]	500+	1	0.2	14 days
Azima and Ogle[1]	100	5	5	17-21 days
Loftus and associates[7]	Not stated	4	—	27 days (case 1) 16 days (case 2) 23 days (case 3) 12 days (case 4)

The morbidity is varied, the duration of jaundice existing from a few weeks to seven months. No deaths due to chlorpromazine have been reported. However, Boardman[9] reported a patient being treated with chlorpromazine who died in auricular fibrillation and had a number of other complications that could have accounted for the death.

According to Winkelman,[4] Harper reported that in a few patients in whom administration of chlorpromazine was discontinued because of jaundice, the drug was given again when the jaundice had subsided, and was tolerated without recurrence of the disorder.

SUMMARY AND CONCLUSIONS

Jaundice, obstructive in type, occurred in a patient who had been taking chlorpromazine therapeutically for three weeks. There is extreme difficulty in differentiating jaundice from this cause from that of extrahepatic biliary obstruction. The only evidence in this case that the jaundice was nonobstructive was a negative Courvoisier's sign. Chlorpromazine is being used extensively as a therapeutic drug and has been extolled as a "wonder drug" in the lay press. One popular lay magazine mentioned this complication as being relatively innocuous. At the present time there are no laboratory procedures or definite physical findings to aid the surgeon in determining the cause of the icterus in such a case. A history of chlorpromazine ingestion prior to the onset of icterus, plus laboratory findings of obstructive jaundice, and the microscopic findings on needle biopsy of the liver, should cause deferment of surgical exploration.

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Fetal Hydrocephalus, Face Presentation and Spontaneous Rupture of the Intact Uterus

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THE INCIDENCE of fetal internal hydrocephalus varies from 1:370[1] to 1:2,000[2] deliveries. The incidence of persistent face presentation ranges from 1:369[2] to 1:529[3] deliveries. The following case report presents both complications in a single pregnancy; the pregnancy also terminated in the spontaneous rupture of the intact uterus during labor.

CASE REPORT

A 24-year-old white para 1 was first seen in the obstetrical clinic of this hospital on 16 May 1955, at 14 weeks' gestation. Her last menstrual period was 4 February and the estimated date of confinement, 11 November. At this time she had no complaints except for the common problems of nausea and urinary frequency so often associated with early pregnancy. During her childhood she had had mumps, measles, chickenpox, and whooping cough; a tonsillectomy and adenoidectomy at six years, and an appendectomy at nine years. The family history was entirely negative. Physical examination revealed a normal, well-nourished, well-developed woman whose only findings were the breast changes of pregnancy and a retroverted soft uterus enlarged to the size of a three-month gestation.

Laboratory studies revealed a red blood cell count of 3,810,000 per μl; hemoglobin, 11.5 g per 100 ml; blood type, AB;Rh positive. Urinalysis and a serologic test for syphilis were negative. A roentgenogram of the chest was within normal limits.

The patient was followed at monthly intervals to the 34th week of pregnancy, and the only problem encountered was a tendency for blood pressure elevations up to 140/90 mm/Hg, which responded to rest and mild sedation. Total weight gain was 23 pounds, albuminuria was not present, and the diagnosis of pre-eclampsia was never entertained. At 34 weeks, the patient's repeat hemoglobin value was 13.5 g per 100 ml. She had no complaints, having experienced a comfortable pregnancy. From this point, visits were continued at weekly intervals. To prevent excess weight gain, the patient was given intermittent courses of diuretics, on one occasion ammonium chloride and on another Diamox (brand of acetazoleamide), with good results.

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The first intimation of difficulty arose in the 37th week of the pregnancy, when the examiner was unable to locate the cephalic pole of the fetus, and determined that engagement had not occurred. Pelvic measurements by x-ray at this time were: obstetrical conjugate, 14.3 cm; transverse diameter of pelvic inlet, 13.2 cm; bispinous diameter, 9.7 cm; and pubo-sacro-coccygeal diameter, 13.9 cm.

Roentgenograms showed that the pelvic inlet was anthropoid, with a curved sacrum. The fetus was in the left occiput anterior position. The fetal head was abnormal in these views. It was twice normal in size, and the skull bones were very poorly ossified. The vertex was markedly deflexed on the spine. The impression of the roentgenologist was that this was a normal female pelvis of anthropoid configuration, and that the films were suggestive of hydrocephalus and face presentation.

We decided to permit the patient to begin labor spontaneously, and to decompress the hydrocephalic vertex as soon as the cervix became sufficiently dilated.

Course in Labor

Labor began at 41 weeks' gestation, on 17 November, and the patient was admitted to this hospital three hours after onset of contractions. Admission temperature was 100.4°F (oral); pulse, 86/min; and blood pressure, 110/70 mm Hg. The uterus was enlarged to the xyphoid minus four fingers, and hard uterine contractions occurred every 2½ or 3 minutes, lasting from 40 to 45 seconds; the fetal heart was faintly audible in the right lower quadrant of the abdomen. The previous x-ray and clinical impression of hydrocephalus was confirmed. On rectal examination the cervix was 2 cm dilated and 50 per cent effaced. A urine test for albumin was negative.

At 0300 hours the patient was in early labor. The perineal area was prepared and a soapsuds enema was given. Roentgenographic examination reaffirmed the previous findings, now showing the wide, bulging suture lines and fontanels of the fetal vertex. The patient was now given 50 mg of Demerol (brand of meperidine hydrochloride) intravenously and 100 mg intramuscularly; and 0.6 mg of scopolamine hydrobromide intramuscularly. As a precautionary measure, and to maintain a patent venous channel, an intravenous infusion of 5 per cent dextrose in water was started.

At 0600 hours uterine contractions continued to be severe, 45 seconds in duration, and occurring every three minutes. The patient was resting well and in good condition. Her pulse was 92/min; respirations, 14/min; blood pressure, 120/70 mm Hg; and temperature, 99.2°F (oral). Rectal examination revealed progression of cervical dilatation, and it was thought that the contemplated decompression might be attempted. In the delivery room, with the patient in lithotomy position and under Pentothal (brand of thiopental sodium)-nitrous oxide-oxygen anesthesia, sterile vaginal examination disclosed the cervix to be 4 cm dilated,

80 per cent effaced, and firm. The amniotic sac was artificially ruptured, with the escape of a normal amount of clear fluid. Further examination, during which extreme care was taken not to displace the head or further distend the lower uterine segment, confirmed the impression of fetal hydrocephalus. The head was completely deflexed on the neck, in face presentation with the mentum in right posterior quadrant. The large vertex was floating completely out of the pelvis, and the nulliparous vaginal tissues made any operative procedure difficult, even with the added relaxation afforded by the use of Anectine (brand of succinylcholine chloride). With this difficulty, plus the added problem of the face presentation, it was impossible at this time to perforate the fetal head. The patient being in good condition, it was decided to await further cervical dilatation under close observation, at which time it was believed that craniotomy might become feasible.

At 0700 hours good labor continued, with contractions every 3 minutes and lasting from 35 to 40 seconds. The patient was comfortable, requiring no further sedation. Her temperature was 98.6°F (oral); blood pressure, 120/80 mm Hg; pulse, 92/min; respirations, 16/min. During the previous 15 minutes, an unusual amount of bright red blood had appeared vaginally; abdominal examination revealed no additional abnormalities. The patient was again prepared for vaginal examination. Under Pentothal-nitrous oxide-oxygen anesthesia, sterile examination revealed the cervix to be 7 cm dilated and very thin; the anterior fontanel could be reached, and cranial decompression was felt to be possible. Because of the excessive vaginal bleeding, further intrauterine examination was carefully carried out, with the possibility of uterine rupture or cervical laceration in mind. Such a rupture was discovered along the left lateral wall of the uterus, behind the deflexed occiput, extending well into the fundus, and through which the intestines were readily palpable. The time was 0726 hours; the patient was under general anesthesia, with blood pressure at 120/70 mm Hg; pulse, 104/min; and respirations, 12/min. Intravenous administration of supportive fluids had been started with the onset of labor; 6 per cent Dextran solution was added, and whole blood ordered from the laboratory. The operating room had been preparing for a scheduled gynecologic laparotomy, and with this good fortune the patient's abdomen was opened at 0738 hours—12 minutes after the diagnosis of uterine rupture was made.

Operative Procedure

The abdomen was opened through a lower abdominal midline incision with utmost speed. The uterus, containing a full-term fetus, was found to be slightly dextrorotated. There were about 100 ml of bright red blood free in the peritoneal cavity, but no evidence of either profuse hemorrhage or large hematoma formation.

Attention was first directed toward emptying the uterus. After reflection of the bladder flap, the anterior wall of the uterus was opened with

a classical incision, and the fetus grasped by the lower extremities and extracted. It was necessary to extend the incision from the lower segment to the apex of the fundus to permit passage of the overdistended head. The infant was alive and gasped spontaneously. The placenta was extracted manually, and 0.2 mg of Ergotrate (brand of ergonovine maleate) was given intravenously to control bleeding. Transfusions of whole blood had been started, and to each unit of blood were added 2 ml of Pitocin (brand of oxytocin injection) for intravenous drip.

Inspection of the uterus was then carried out. On the left lateral wall, just posterior to the insertion of the broad ligament, there was a long, ragged laceration extending from the fundus down into the cervix. The edges of the laceration, especially in the lower uterine segment, were ecchymotic and macerated. There was no sign of massive arterial bleeding, and it was evident that the left uterine artery was intact, albeit in the exact edge of the laceration. It was believed that the laceration could be repaired and the uterus conserved. The free edges of the laceration were trimmed, and closure started at the superior apex with a medium continuous locked chromic catgut suture, which of necessity encompassed the left uterine artery in its passage, bringing together both myometrium and serosal surface of the uterus. The left ureter was identified as it crossed the pelvic brim, and its course avoided in passing the suture. It was possible to close completely the serosal surface of the uterus with this suture, which effectively controlled bleeding from the laceration. A second similar suture was placed on the endometrial surface from within the uterus to approximate the remaining myometrium and endometrium. When the repair had been completed, the thickness of the uterine wall along the rupture line was equal to that at any other point. Pulsations of the left uterine artery were absent.

The classical incision in the anterior wall of the uterus was repaired in three layers in a routine manner, and the bladder flap reapproximated as high on the fundus as possible. All free blood was cleaned from the peritoneal cavity; both adnexa were found to be normal. Hemostasis was satisfactory, and the abdomen was closed in a routine manner.

The patient had remained in good condition during the entire two-hour operative procedure, never experiencing vascular collapse. She received 1,500 ml of whole blood while on the operating table, which approximately replaced the estimated blood loss. She recovered from anesthesia while in the operating room, and was returned to the ward in good condition.

Postoperative Course

The infant delivered during the operation was a living female weighing 3,340 grams (7 pounds 6 ounces), with a huge hydrocephalic head and a concomitant spina bifida in the thoracic spine. The infant's head measured 18 inches; the chest, 11½ inches; and the abdomen, 12½ inches in circumference, and she was 19 inches long. The infant died in the nursery 10 minutes after birth.

The patient's postoperative course was relatively benign considering the nature of the surgical procedure. A febrile reaction up to 102°F (oral) continued for 48 hours postoperatively, but responded readily to penicillin and streptomycin sulfate therapy. For the first 36 hours there was some gastric dilatation and paralytic ileus, relieved by a Levine tube and suction. By the third postoperative day intestinal motility was normal, and oral feedings were resumed. The patient's only postoperative complaint was that of colicky pain in the left flank and left side of the abdomen, which again raised the question of the integrity of the left ureter. An intravenous pyelogram, taken on the fourth postoperative day, showed normal renal function bilaterally, with no dilatation or obstruction of either ureter. Postoperative blood studies revealed a hemoglobin value of 12.5 g/100 ml and a white blood cell count of 9,600 per μl with a differential count within normal limits. The remaining recovery was uneventful; the skin sutures were removed on the sixth postoperative day, and the abdominal incision healed by primary intention. The patient was discharged on the eleventh postoperative day in good condition.

Two weeks later, the patient was re-examined in the gynecology clinic prior to her departure to her home in another state. She presented no complaints, and lochia was normal. Examination revealed the uterus to be involuting well, mobile, and anterior in position; both adnexa were normal. Visualization of the cervix revealed that the laceration had extended through the cervical os, and on the left lateral side of the cervical os there remained a residual gap, extending into the left fornix of the vagina. The patient was advised to have a tracheloplasty performed in a few months, and was remitted to the care of her private family physician.

To eliminate the dangers inherent in ignorance, the patient and her family were completely informed as to her condition; were advised to seek competent medical care promptly for any future obstetrical or gynecological problems, to seek out a hospital center where large blood banks and active surgical suites would make complications safer to handle; and were absolutely warned against any uterine labor contractions.

DISCUSSION

Internal hydrocephalus is an accumulation of cerebrospinal fluid in the ventricular system of the brain, which results in expansion of the vertex. It is a relatively rare but potentially serious complication of pregnancy. Associated fetal anomalies are common; spina bifida occurs in from 35 to 40 per cent of these cases. In all but minor cases of hydrocephalus there is marked disproportion between the fetal vertex and the maternal pelvis, and the patient is subject to all of the dangers of obstructed labor, the most serious possibility being rupture of the uterus. This danger is increased by the marked distention and thinning of the lower uterine segment in vertex presentation. The major mortality is

usually seen in undiagnosed and untreated cases. Recent figures show an incidence of ruptured uterus in these cases of 3.4 per cent, and also a maternal mortality of 3.4 per cent.[1]

Diagnosis. The diagnosis of fetal hydrocephalus is usually not easy, but is rarely missed if the possibility is actively considered. It should be suspected if on abdominal examination the vertex is floating high and feels unusually broad, if there is absence of the typical cephalic pole of the fetus (normally hard, round, and mobile), and if there is tenderness to palpation over the lower uterine segment. On roentgen examination the fetal head may seem enlarged in either vertex or breech presentation because of x-ray distortion; grave errors have resulted from misdiagnosis on this score in cases of normal pregnancies.[4] Classically, the following signs are helpful in the x-ray diagnosis: the relatively small face in relation to the enlarged skull; the vertex appearing globular rather than ovoid; poor ossification of the cranial bones, which may be scarcely visible, with wide fontanels and suture lines. In some cases the roentgenographic findings are not sufficient for diagnosis. Intrapartum, this diagnosis should be entertained if there is any unreasonable delay in the progress of labor —unexpected dystocia in the multipara with a good obstetrical history, or a floating vertex in the second stage despite an adequate pelvis and good uterine contractions. With cervical dilatation, vaginal examination may reveal the widened cranial sutures and the "typical" thin, elastic, parchmentlike consistency of the fetal skull. Manual intra-uterine examination may be necessary to confirm the diagnosis, but great care must be exercised to preclude rupture of the already thin lower uterine segment by this maneuver.

Management. The recommended management of this complication is decompression of the distended head by the use of an appropriate needle or cannula, or by perforation with Smellie scissors. In breech presentation, puncture of the after-coming head may be accomplished through the base of the skull, through the bone behind the ear, through the foramen magnum, by incision into the cervical spinal canal, or through a spina bifida. In vertex presentation the head should be decompressed as soon as the cervix is sufficiently dilated; perforation should not be delayed until full dilatation because the first stage of labor may be slow, tedious, and painful, and the uterus may rupture before this stage is completed. Labor should then be permitted to proceed in its normal course to full dilatation and delivery; Willett's or Jacobs' clamps may be used for traction on the collapsed fetal scalp to accelerate the course. In any event, constant close observation of the progress of labor is mandatory.[5]

Face Presentation. The problem of face presentation is ordinarily less serious. In these cases, the fetal neck is sharply extended

and the occiput is in contact with the fetal back. The early diagnosis of this presentation is difficult, and is usually made on rectal or vaginal examination during labor. Antepartum roentgenographic views may be suggestive. The most frequent cause of this malpresentation has always been thought to be some degree of cephalopelvic disproportion.[3, 6, 7] Sagging positions of the uterus, low implantations of the placenta, loops of umbilical cord around the fetal neck, and anencephalia have been considered less frequent etiologic factors. It has recently been suggested that secondary face and brow presentations are very rare, and that hyperextension of the fetal head, because of increased tone in the nuchal extensor muscles, was common; in etiology, face and brow presentations may thus be primary rather than secondary.[4]

The prognosis in face presentation has been improved by the acceptance of a more conservative management of these cases. There is an increased fetal risk inherent in the condition, probably because of the prolongation of labor. The anticipated fetal loss is about 10 per cent.[2] Management calls for early diagnosis and the elimination of traumatic delivery where cephalopelvic disproportion exists. In the presence of the latter, elective cesarean section should be the rule. In multiparous patients a fetus in a persistent mentum posterior presentation can usually be safely delivered by a forceps rotation and extraction; or, if the baby is very small, by version and extraction. In multiparae when neither of these courses is feasible, and in all primiparae with the fetus in a mentum posterior presentation in whom a full trial of labor has not accomplished anterior rotation of the chin, cesarean section is the safest course.

Uterine Rupture. Spontaneous rupture of the uterus during labor without antecedent surgical procedures or prior cesarean sections is unusual. The incidence of both primary and secondary uterine rupture intrapartum in registered patients is estimated at 1:2,000 deliveries. Fifty per cent of these ruptures occur in postcesarean section cases.[2, 9–11] Rupture of the pregnant uterus is responsible for 5 per cent of all maternal deaths today. Only 40 per cent (17 cases out of 43 reported) of intrapartum primary uterine ruptures in one series[12] were spontaneous, and none occurred in primigravidae; in all almost cases there was some element of dystocia or cephalopelvic disproportion—large fetus, malpresentation, hydrocephalus—and the majority of patients presented were in the older age groups, with great multiparity. A recent resumé of this problem among South African Bantu women[13] presents interesting figures: The incidence of uterine rupture was 1:137 deliveries, with a maternal mortality of 32 per cent. Only 10 per cent were secondary ruptures at the site of an old cesarean section scar, and 90 per cent were primary ruptures. Spontaneous rupture of the intact uterus occurred in 68 per cent of these cases, but of these,

only 8 per cent occurred in primiparae, and 30 per cent in grand multiparae. The great variation of these figures from those accepted in this country is doubtless due to the differences in population observed and in maternal care.

The diagnosis of impending rupture of the uterus, and even of actual rupture, may be extremely difficult; the signs are those of cardiovascular collapse with abdominal pain and tenderness, but may be minimal or silent for many hours.[14] This one fact is responsible for many maternal fatalities. It is, therefore, imperative in the proper conduct of labor to suspect this accident where its statistical incidence is increased, and to proceed accordingly. The treatment is immediate laparotomy, and usually hysterectomy. The value of the uterus for future child-bearing, in cases where conservative repair of the uterine tear is practiced, may be questioned; repeated ruptures of such repaired scars are recorded.[15, 16] Yet, the report of the 50 ruptures in South Africa[13] where the uterus was conserved in 72 per cent of the patients coming to operation, shows that repair rather than hysterectomy must be feasible in many instances.

The combination of hydrocephalus and face presentation is fortunately very rare; in 304 cases of hydrocephalus, only three cases of brow presentation (1 per cent) and no cases of face presentation were reported.[1] In any term case with more than minimal hydrocephalus there is no question of normal vaginal delivery, yet one is reluctant to subject a patient to cesarean section in whom the fetal results will be so tragic.

In the case reported here, the face presentation made impossible the desired puncture of the overdistended fetal skull as early in labor as was desired; all such manipulations were further hindered by the nulliparous introitus, perineum, and cervix. The delay while awaiting further dilatation of the cervix, which at the time was not considered excessive, resulted in a spontaneous, primary, and unheralded rupture of a primigravidous uterus in the first stage of labor—another rare complication toward which the tense distention of the lower uterine segment bore a clear etiologic relationship. This case amply demonstrates all of the gravest complications of both hydrocephalus and face presentation. On hindsight it is clear that if one is again faced with this combination, cesarean section early in labor would be the course of choice.

The question of the operative management of this ruptured uterus remains to be discussed. Although the uterine tear was long and jagged, and the indication for hysterectomy urgent, there was reluctance to do this in a young primigravida. A satisfactory closure of the uterine laceration was obtained, with sacrifice of the left uterine artery in the process; the danger of compromising

the left ureter was minimized by visualizing its course. It was, therefore, compatible with the patient's immediate safety to conserve her uterus; the importance of this decision in the patient's postoperative psychologic recovery and her future mental health became increasingly evident from day to day. The physiologic question remains whether the left uterine artery, which was not transected but simply encompassed in a chromic catgut locked continuous suture, will recanalize? If not, will the single right uterine artery, sufficient with all the ancillary uterine vascular supply to maintain the nonpregnant organ, be able to supply the demands of pregnancy? Will the two uterine scars be strong enough to maintain their integrity with the distention of the organ in pregnancy? It is felt that any dangers to the mother can be minimized by close medical observation. With adequate precautions, perhaps at least one successful gestation may yet be granted this patient.

SUMMARY

A case of fetal hydrocephalus complicated by face presentation and spontaneous intrapartum rupture of the intact uterus is presented. The problems in management of fetal hydrocephalus, face presentation, and ruptured uterus are described.

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EFFECTIVE OBSTETRICAL ANALGESIA

There is no substitute for a patient's confidence in her medical attendant. This is particularly true in the physician-patient relationship in the practice of obstetrics. The doctor must gain his patient's confidence early during the prenatal period. The first contact with the patient at the obstetrician's office usually cements this relationship. It is at this first visit that the seed of obstetrical analgesia is planted. Fear must be dispelled. This can be accomplished successfully by an intelligent and sincere discussion regarding the salient and pertinent points of prenatal care and labor. The patient's confidence in her physician must have been stimulated sufficiently so that upon leaving his office she believes, without a question of a doubt, that she had made the correct choice of her attendant. This is the first step toward effective obstetrical analgesia.

—HARLEY E. ANDERSON, M. D.
in *Nebraska State Medical Journal*
p. 12, Jan 1954

Intestinal and Ureteral Obstruction Caused by An Unusual Abdominal Cyst

ERWIN A. COHEN, M. D.

AFTER a patient with intestinal obstruction is operated on, the exact cause is usually finally determined. In the case reported below, although the mechanism of obstruction was revealed, the specific cause is still unknown.

CASE REPORT

A 41-year-old Filipino man, a U. S. Government worker, was admitted on 20 October 1952 with a history of generalized, crampy abdominal pains and vomiting of approximately 17 hours' duration. The abdomen became distended after the onset of the pains. He had a normal bowel movement two days before admission, and his urine output was scant on the day of admission. In 1951 he had had a short similar episode and was treated with enemas and intravenous fluids.

Physical examination was noncontributory except for the abdomen, which was distended. There was a large, firm mass occupying the lower abdomen and left upper quadrant. The mass was immobile and slightly compressible. The percussion note over the mass was flat; the rest of the abdomen was tympanitic. Auscultation revealed active and high-pitched peristalsis. There was bilateral costovertebral-angle tenderness. Rectal examination revealed a normal prostate, above which was a compressible bulge into the rectal ampulla. Blood count revealed a slight leukocytosis, and urinalysis a 1-plus albumin and a specific gravity of 1.040. A catheter inserted into the bladder after voiding produced a few milliliters of urine. Roentgenograms of the abdomen in the flat and erect positions revealed gas up to the region of the descending colon and dilated loops of small bowel, with fluid levels in both upper quadrants. In the central and lower abdomen was a homogeneous density. A Miller-Abbott tube was passed and the patient placed on intravenous fluids.

The following day, the blood urea, CO_2, and chlorides were within normal limits. The patient no longer had cramps and had a bowel movement. The Miller-Abbott tube was in the small bowel. Cystoscopy revealed a downward bulge on the dome of the bladder; indigo carmine excretion was delayed (12 minutes); intravenous pyelograms revealed normal kidneys, dilatation of both ureters down to the pelvis, and slight

From Sinai Hospital of Baltimore, Inc., Baltimore, Md.

lateral displacement of the lower two thirds of the left ureter. The mass was anterior to the genito-urinary system. Barium enema (fig. 1) was carried out over two hours after the intravenous pyelogram. The colon was normal. Dye was still seen in the ureters and there was a pressure defect on the dome of the bladder. At this time the Miller-Abbott tube was in the jejunum.

Figure 1. Barium enema more than two hours after intravenous pyelogram. Note hazy area depicting abdominal mass.

Since the bowel and ureters were partly obstructed by the mass, an operation was performed the following day. A lower left transverse incision was made. When the posterior rectus sheath was divided, the wall of the mass was seen without encountering free peritoneum. In an attempt to get above the mass in order to enter the peritoneal cavity, the incision was extended vertically in the midline. Free peritoneum was not seen, but a few small, myxomatous masses that did not communicate with the large mass were removed. Blunt dissection in this region revealed a portion of what appeared to be transverse colon intimately connected with the upper wall of the mass. Lateral exploration

revealed that the mass was in contact with the aorta and iliac vessels, but free from the kidney and upper ureter and separable from the bladder. It appeared to continue over to the right; therefore, the transverse incision was extended to the right side. After the posterior rectus sheath was divided, peritoneum was encountered in the right lower quadrant and freed from the rectus sheath. No dilated loops of bowel were seen or felt. Because the mass was intimate with the above vital structures, and seemed to be cystic, the following was done.

The area was surrounded with packs, and an incision was made into the mass. There was a gush of fluid containing small, brownish, irregularly shaped, flaky particles. Approximately 1,500 ml of fluid was suctioned; a large amount was absorbed into packs. There were eight large spheroid or dumbbell-shaped masses (up to 6 by 3 by 2 cm) floating free in the cyst (fig. 2). The surfaces were brown and velvety. One was sectioned, and contained brown gelatinoid material with numerous thin

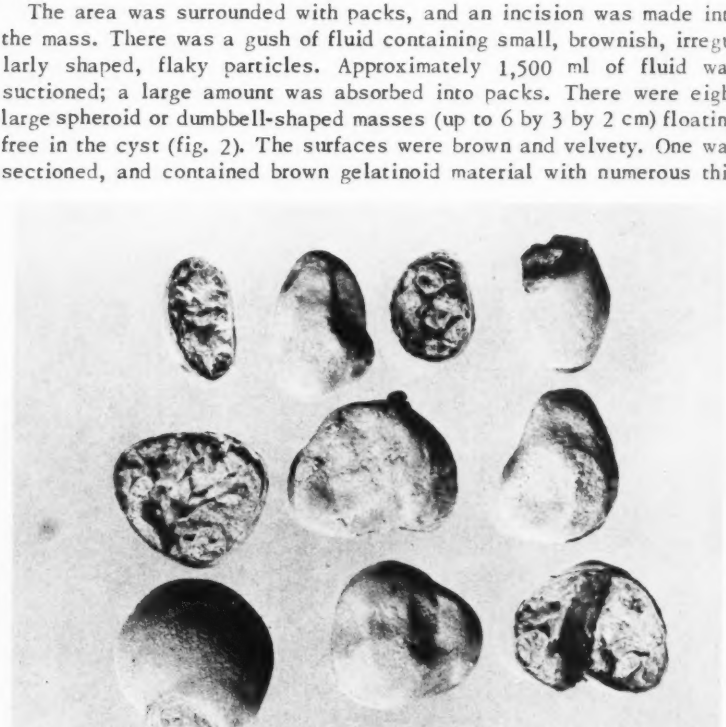

Figure 2. Specimens removed from abdominal cyst. Courtesy of Armed Forces Institute of Pathology, Washington, D. C.

brown septa. The wall of the cyst was approximately 2 cm thick, and its inner lining was brown, slimy, and velvety. The cyst still could not be freed from the vital structures. In attempting to free it from the transverse colon, a part of the muscularis of the colon was split. This was sutured with 0000 silk. A biopsy of the wall was taken. The inner lining was coated with phenol until it turned gray; then it was cleansed with alcohol. Marsupialization was performed by joining the split edges of

the mass with the adjacent posterior rectus sheaths, leaving a defect in the center. The linea alba, anterior rectus sheaths, and lateral abdominal muscles were approximated with interrupted steel sutures. Three long pieces of iodoform gauze were packed into the cavity, the ends protruding. The subcutaneous tissues were drained and the skin was approximated with interrupted steel sutures. Routine, fungus, and acid-fast smears and cultures taken from the cyst wall at operation were subsequently reported as negative.

Pathologist's* Report: "Cyst of abdominal wall, with daughter cysts, probably due to *Echinococcus granulosus* parasite infestation." Microscopic description: "In sections through the nodules stained with hematoxylin and eosin, each appears encapsulated by a moderately thick chitinous membrane. These capsules have irregular projections extending outward from their external surfaces, as if torn away from another surface. The material inside is amorphous and homogeneous, and is separated by more chitinous septa. No true cells are found. In sections through the large cyst wall, similar amorphous material is found with surrounding concentrically laminated chitinous material. A few inflammatory cells are noted." The final report from the Armed Forces Institute of Pathology was: "Abdominal cyst, type undetermined."

The patient recovered from the operation uneventfully. Bowel and urinary function rapidly returned to normal, and his wound healed promptly.

There was slight serous drainage from the cyst cavity. Within three weeks the drains were removed. Thereafter, the cavity was irrigated frequently, with the production of a few small pieces of necrotic gray material. Two weeks later, the cavity was outlined with Diodrast. It now measured approximately 9 by 5 by 4 cm in the left lower anterior part of the abdomen. Because of local infection and narrowing of the drainage tract, the cavity was unroofed a month later.

Pathologist's Report: "Granulation tissue with marked acute inflammatory reaction."

The organisms were sensitive to Aureomycin (brand of chlortetracycline hydrochloride). This, plus repeated irrigations, cleared the infection. Irrigations were continued on an outpatient basis. A month later it was noted that a little green, mucoid material exuded from the cavity. This was repeatedly examined microscopically and cultured, but nothing specific was found and it was thought to be a reactivation of the original process. Treatment consisted of instillations of 10 per cent silver nitrate followed in five minutes by generous irrigation with saline, with further irrigation after some hours. This was done every two or three days, and within 10 days the mucoid material ceased to appear. At this time the cavity could hold 20 milliliters.

*First Lt. Myron E. Rubnitz, MC, USA, Pathologist

Although saline irrigations were continued the mucoid material reappeared three weeks later and was treated as above. The drainage then became blood-tinged, and less fluid was aspirated than was put in. Therefore, Diodrast was injected into the cavity (fig. 3). It ran into a small tract that connected with the transverse colon. Thereafter,

Figure 3. Injection of sinus tract showing entrance of dye into transverse colon.

only the superficial portion of the tract was irrigated. A later injection of Diodrast showed no communication with the colon. Follow-up examination a year later revealed that the small abdominal sinus drained a small quantity of mucoid material every two or three weeks, in between which there was no drainage. Laboratory examination of the drainage material continued to be negative. The patient feels well and is working.

DISCUSSION

This patient might be considered to have had a mesenteric cyst. The following types of mesenteric cysts have been de-

scribed:[1] (a) lymphatic cyst, (b) blood cyst, (c) hydatid cyst, (d) dermoid cyst, (e) multiple lymphatic cysts, and (f) enterogenous cyst.

There is no resemblance to a lymphatic or blood cyst since blood or lymph was not encountered. Enterogenous cysts have been described as large and as producing intestinal obstruction.[2] Treatment has been resection of the cyst with the contiguous bowel. However, there was no bowel mucosa in the lining and no smooth muscle in the wall. A dermoid cyst of the greater omentum has produced intestinal obstruction,[3] also treated by resection. This cyst does not resemble a dermoid cyst because no material resembling any germ layer was seen.

The question of an echinococcus cyst was brought to mind when the cyst was opened. This was further fostered by the initial histologic report. The relative distribution of the sites of occurrence of most echinococcus cysts are as follows:[4,5] liver, 57 to 74.4 per cent; lungs, 3.8 to 16.2 per cent; omentum, mesentery, and peritoneum, 1.37 to 18.2 per cent; skin, subcutaneous tissues, and muscles, 0.7 to 9.1 per cent; spleen, 1.2 to 9.1 per cent; kidneys, 1.6 to 4.74 per cent; and brain, 0.16 to 2 per cent. Rare sites((*i. e.*, bone, et cetera) have also been described. A review of cases of abdominal echinococcus-producing intestinal obstruction has revealed that the origin of the cyst in four patients was in the omentum.[5-8] One of these cysts was calcified and was palpated on rectal examination.[6] Some patients had multiple abdominal cysts occurring in the omentum, mesentery, or liver. Three cysts occupied the pelvis. In three patients the cyst was excised. Two patients did well, and one died.[7] In one patient the cyst was marsupialized and the patient did well.[8] Echinococcus cysts of the left lobe of the liver which are in the abdominal cavity and connected to the liver by a tongue of tissue have been described.[6,9] In a report of a case of spindle cell sarcoma arising in a pancreatic hydatid cyst[10] it was noted that adhesions of the cyst to the anterior abdominal wall did occur in the last stages. The preceding brought to mind that the cyst might be primary in the pancreas, whether echinococcus in origin or nonspecific. There is no support for or against a hydatid cause, and there is no evidence that it was a nonspecific cyst, because there was no history of severe abdominal trauma, abdominal surgery, or any form of pancreatitis. The Casoni test[6] and precipitin and complement-fixation tests are reasonably specific and valuable diagnostic aids. Unfortunately, these tests could not be done.

A case of abdominal amebic tumor producing intestinal obstruction has been described.[11] Treatment was with emetine, with relief of the obstruction and decrease in the size of the abdominal mass.

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Bilateral ureteral compression has been described with pelvic tumors, retroperitoneal masses, and retroperitoneal inflammatory processes.[12] None of these has been described as associated with mechanical intestinal obstruction. An unusual case was reported of a seven-year-old boy operated on because of right lower abdominal pain and a local mass in which only a dilated ureter (the mass) and subsequently bilateral hydronephrosis was demonstrated.[13] With partial obstruction to a ureter it has been shown that concentration of intravenously injected dye may be seen in the upper urinary tract one to two hours after injection.[14]

CONCLUSIONS

The case reported here is of interest because of the combination of intestinal and ureteral obstruction secondary to a large abdominal mass of unknown cause. The presumptive diagnosis is hydatid cyst. However, review of the slides and specimens by the Armed Forces Institute of Pathology did not reveal evidence for a more definitive diagnosis. The slides were reviewed by several parasitologists and pathologists, and nothing further was suggested except the possibility of a degenerated retroperitoneal fibroma or fibrosarcoma.

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A MESSAGE FROM THE A. M. A.

A brief historical report appeared in the January issue of this *Journal* about the American Medical Association. Since then, successive issues have covered the responsibilities and activities of the following A. M. A. Councils: the Council on National Defense, the Council on Medical Education and Hospitals, and the Council on Medical Service. It was pointed out in one of the previous messages that 13 A. M. A. standing committees serve the House of Delegates and the Board of Trustees. They recommend policies on all activities within their jurisdiction to the Board of Trustees and the House of Delegates.

The message this month will be devoted to the Law Department of the American Medical Association. Departments differ from councils and committees in that they are essentially staff operations with the general scope of their work defined by the Board of Trustees. Their activities are administered by a director, under the supervision of the A. M. A. Secretary and General Manager.

In 1927 the Association established a Bureau of Legal Medicine and Legislation. This functioned until August 1954, when the present Law Department was organized for the purpose of consolidating all legal functions of the Association. While the former Bureau of Legal Medicine and Legislation acted primarily as a clearinghouse of medico-legal information, the Law Department acts in addition as house counsel, so to speak, for the American Medical Association.

The Department staffs the Association's Legislative Committee, its Judicial Council, the Council on Constitution and Bylaws, and the Committee on Medico-Legal Problems. The Legislative Committee, in cooperation with the A. M. A.'s Washington Office, handles the extensive interests which the Association has in national medical legislation. The Judicial Council is the Supreme Court of the medical profession in questions of ethics; the Council on Constitution and Bylaws receives, considers, and processes proposed changes to the constitution and bylaws of the Association and to the Principles of Medical Ethics. The Committee on Medico-Legal Problems, which is composed of experts in the field of forensic medicine, considers those aspects of medical science which may be utilized in the better administration of justice. This Committee has pioneered in the development of chemical tests for

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense. —*Editor.*

intoxication and blood grouping tests in disputed paternity proceedings, as well as in the prevention of malpractice. It is continually stressing the importance of substituting a medical examiner system for the antiquated coroner system.

The function of "house counsel" also includes being available to the House of Delegates, the Board of Trustees, and the various councils, committees, and departments appointed by them. The Law Department also acts as legal counsel in business matters and litigation affecting the Association.

In the field of legal medicine, the Law Department maintains a comprehensive file of information concerning the application of law to the many affairs of organized medicine and individual physicians. A library has been assembled on a wide variety of medical subjects which have been litigated in the courts. These briefs are available on a loan basis. The topics embrace medical licensure, including the scope of sectarian practice, basic science requirements, hospital staff membership, corporate practice of medicine, various aspects of professional liability, disciplinary actions by medical associations, and others.

The area of interest of legal medicine includes consideration of everyday matters such as contracts in restraint of practice, forms of consent in connection with operative procedures; the use of tissue in human homologous transplants, and matters of taxation. More abstract but equally important items to which the Department devotes attention include questions concerning the legal aspects of artificial insemination, the study of methods to correct abuses in the field of medical expert testimony, and the general improvement of relations between medicine and the law.

The Law Department, in its efforts to develop better rapport between medicine and law, recently conducted three regional medico-legal symposia where doctors and lawers explored and attempted to resolve areas of misunderstanding which adversely affect the best interest of the individuals they serve in their respective professional capacities. A special feature of these symposia was a two-part demonstration showing the proper and improper methods of preparing and examining the medical expert witness in a personal injury action. The demonstration has since been presented on numerous occasions to audiences composed of doctors or lawyers, or both.

This series of articles, to acquaint physicians in uniform with the organization, function, and purpose of the American Medical Association, will be continued in the next and subsequent issues of the *U. S. Armed Forces Medical Journal.*

DEATHS

GREENBERG, Harry, First Lieutenant, MC, USAR, of Los Angeles, Calif.; stationed at 16th Army Field Hospital, Germany; graduated in 1953 from the University of Geneva Medical School, Geneva, Switzerland; commissioned a First Lieutenant 8 June 1953; ordered to active duty 3 September 1953; died 7 February 1956, age 31, in Germany, of rheumatic heart disease.

KENDRICKS, Edward James, Brigadier General, USAF (MC), of Royal Oak, Mich.; stationed at School of Aviation Medicine, Randolph Air Force Base, Tex.; graduated in 1922 from Northwestern University Medical School, Chicago, Ill.; commissioned a Second Lieutenant 31 July 1930; ordered to active duty 1 October 1930; died 17 February 1956, age 56, at Randolph Air Force Base Hospital, of myocardial infarction.

KILROY, Sadie Elizabeth, Captain, ANC, USAR, of Ottawa, Ontario, Canada; stationed at U. S. Army Hospital, Fort Leonard Wood, Mo.; graduated in 1931 from the Buffalo City Hospital School of Nursing, Buffalo, N. Y.; commissioned a Second Lieutenant 11 March 1942; ordered to active duty 1 July 1942; died 23 February 1956, age 49, at Fort Leonard Wood Army Hospital, of a cerebral hemorrhage.

LEWIS, Roy Donald, Commander, MSC, USN, of New Orleans, La.; stationed at Headquarters, Eighth Naval District, New Orleans, La.; entered the naval service 5 February 1923; died 10 March 1956, age 50, at his home in New Orleans.

SINE, Arnot Crawford, Lieutenant Colonel, MC, USA, of Silver Spring, Md.; assigned to the Office of The Surgeon General, Department of the Army, Washington, D. C.; graduated in 1941 from the State University of Iowa College of Medicine, Iowa City, Iowa; appointed a First Lieutenant, USAR, 1 June 1941; commissioned a Captain in the U. S. Army, 12 January 1943; died 1 January 1956, age 41, at his home in Silver Spring.

SMITH, Howard Carlton, Captain, DC, USNR, of Pasadena, Calif.; stationed at U. S. Naval Air Station, Corpus Christi, Tex.; graduated in 1919 from Tufts College Dental School, Boston, Mass.; appointed a Lieutenant Commander and ordered to active duty in 1942; released to inactive duty in May 1946; returned to active duty October 1950; died 5 February 1956, age 59, at Corpus Christi.

TURBINI, Lauro Joseph, Captain, DC, USN, of West Newton, Mass.; stationed U. S. Naval Air Station, Quonset Point, R. I.; graduated in 1927 from the Tufts College Dental School, Boston, Mass.; commissioned a Lieutenant (jg) 29 July 1931; died 8 March 1956, age 53, in Chelsea, Mass., of pulmonary edema.

VINCENT, Burnell Wayne, Captain, DC, USN, of Norfolk, Va.; stationed at U. S. Naval Hospital, Portsmouth, Va.; graduated in 1934 from the Kansas City-Western Dental College, Kansas City, Mo.; appointed a Lieutenant (jg) in the U. S. Naval Reserve 6 June 1938; ordered to active duty 1 April 1941; transferred to the Regular Navy in 1946; died 24 February 1956, age 48, in Portsmouth, of myocardial intarction.

ZANDAN, Jacqueline Claire, Second Lieutenant, ANC, USAR, of Springfield, Mass.; stationed at Madigan Army Hospital, Tacoma, Wash.; graduated in 1953 from the Columbia University School of Nursing, New York N. Y.; commissioned a Second Lieutenant and ordered to active duty 15 December 1954; died 17 February 1956, age 24, at the Madigan Army Hospital.

EDITORIAL

The U. S. Armed Forces Medical Journal *has obtained from the* New York Times *permission to reprint a leading editorial from their Sunday edition of 11 March 1956. It is of particular interest to physicians and dentists and doubly so to those of you who are stationed in the less fortunate parts of the world as described in the article. It goes deep into the roots of unrest in various parts of the world, and as you read the article you will understand that some of the primary elements of this unrest are due to disease, poverty, and lack of food. I am sure you will agree that the* New York Times *is to be congratulated on this editorial and on pointing out that these problems are very much to the fore in our thinking. For example, this is one of the reasons why we have an Interdepartmental Committee on Nutrition; this is why we are studying nutritional problems in these countries and trying to help in their solution; this is why the Department of Health, Education, and Welfare is assigning its medical officers to the International Cooperation Administration to work with the governments of these various countries; and this is why the Department of Health, Education, and Welfare is lending its medical officers to the World Health Organization in cooperation with private groups such as the Near East Foundation and others, to help in bringing better health and conditions of living to these nations, as well as to bring about an understanding of the desire on the part of the United States to share our manifold blessings and opportunities.*

I commend this editorial to all of you.

Frank B. Berry

FRANK B. BERRY, M.D.
Assistant Secretary of Defense
(Health and Medical)

RUSSIA DIDN'T INVENT FLIES

The eight SEATO foreign ministers who were meeting at Karachi last week adjourned with the reluctant reminder that there was no "convincing evidence" that the Russians had abandoned their "efforts to subvert, weaken and overthrow" other peoples' governments. We need to be so reminded. The Soviet purpose has not changed. If for one reason or another—including our concentrated efforts to defend ourselves by retaliatory measures—Moscow has abandoned the use of naked force, it is employing other methods for the same objective.

But the world is not so simple that we can save it by force of arms or by making faces at the Russians. The Russians are taking advantage of a period of majestic and confusing change, but in spite of the revolutionary aroma with which they have surrounded themselves, they did not cause the change.

The world's trouble spots are almost exclusively inhabited by people with certain common characteristics: they have ceased, or are trying to cease, to be colonially exploited; God made them brown or yellow or black or red rather than white; they are poor; they are not well fed or well housed; they don't feel well, and they live a comparatively short time.

This is true in Iraq and Iran, in Lebanon, Jordan and Syria, in Saudi Arabia and Egypt and along the shore westward until we come to Tunis, Algeria and Morocco; in the Far Eastern countries which SEATO cultivates, where the Colombo Plan flourishes and where liberty appears in an unaccustomed and inexperienced guise. There is a mixture of politics, of technological backwardness, of resources not fully used, of human labor wasted, of human vitality kept down by hunger and disease.

Wherever these conditions prevail there appears in some sort of clothes and with some form of face a little man from Moscow. We do not read about this little man as we do about Mr. Bulganin and Mr. Khrushchev and their retinue, but he is there, lavishing sympathy, which does not cost anything in rubles, and offering steel mills or comparable tools which have to be paid back in fixed installments.

Wherever there is an unhealthful fly or a lethal type of mosquito or a flea hopping around with a disease in its little insides, wherever there is too little to eat, wherever there are too many persons in one room, the little man from Moscow appears. He does not tell his new friends what things are really like in Moscow or in the country districts of Russia or in the Siberian prison camps. He tells them how things are or will be in a mythical Communist heaven.

Words are not the final answer to such visitors. For people who don't speak English or Russian our words are no better than Russian words. It is deeds that count, and a real friendship behind the deeds. It will probably be necessary for us to work miracles in the underdeveloped parts of the world. To do this we may have to forget about Russia for an hour or so at a time and put our minds on the constructive work of helping people who need help and making friends of people who need friends—and whom we need for friends.

Let us undertake this task clear-eyed. Russia did not devise the evils we are trying to cure. Russia is not responsible for the retarded economic growth, the high death rates, the unfathomable and curable misery from which more than half the human race suffers. Russia did not invent typhoid, ophthalmia, cholera and other diseases—afflictions born and spread by insects in conditions of poverty and filth. Russia didn't invent flies.

If we are to defeat communism we must give up some childish legends and concentrate on the easily available proof that a free society can do more to make mankind well and happy than anything the children of Marx and Lenin have to offer.

CORRESPONDENCE

To the Editor:—Since leaving the Armed Service, I have found it both pleasurable and profitable to include your journal in my periodic "browsing" at the library. Recently, while so engaged, I found in your June 1955 issue a message by Dr. Frank B. Berry on "Spit" particularly fitting for our times. I continued to leaf through the volume more leisurely than usual, and quite by accident came upon Colonel Alfred A. Grebe's review of "Clinical Orthopaedics", Vol. IV, on page 929.

In his review Colonel Grebe states: "Garrett Pipkin uses seven pages to discuss dislocation of the carpal lunate - - - - -. He deemphasizes the value of good roentgenography in the management of this injury."

For Colonel Grebe so to interpret my writing is surely my fault. I must have failed to be lucid. It was not my intention to create such an impression; and if such is being read into my statement, I want to be the first to correct it.

My actual statement is: "Many failures to make a proper diagnosis arise from dependence upon indifferent roentgenograms. Interpretation of the carpal mosaic presents problems for the expert." My authorities for this statement are the late John B. Murphy, who approached the problem in the dawn of roentgenographic diagnosis, and L. D. Stevenson from the more recent British literature. It was my intention to convey the idea to the reader that accurate diagnosis of wrist injuries had been and still continues to be a difficult problem.

I then continued: "Such difficulties (*i. e.* indifferent x-rays) could be avoided by the surgeon by a careful examination of the patient, making a clinical diagnosis, so that his case is presented to the department of roentgenography for confirmation of the diagnosis, rather than for a diagnostic survey." The patient should not be just x-rayed, and never clinically examined.

The actual title of my chapter being discussed is: "A Presumptive Test for Reduction of Carpal Lunate Dislocation". My thesis is that a clinician worthy of the name should know the status of a dislocation from a clinical examination. My "ideal" in this regard centers around a legend attributed to Sir Robert Jones. It is said that a group of ten or twelve shoulder disabilities were collected for his clinic, none of which he had ever seen; yet before any of them had the opportunity of even removing their jackets he went down the line and accurately named each disability.

I think Dr. Berry and I are talking about the same thing in our widely separated subjects. Dr. Berry says in effect that a surgeon should depend upon a sound technic and not upon an antibiotic umbrella. I say that a surgeon should be able to make a clinical diagnosis and not depend entirely upon the department of roentgenography. Dr. Berry does not state that antibiotics are not valuable; and I have not stated that roentgenograms are not of value.

I trust that this clarifies my position and that you will print my letter in your section on correspondence.

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Fourth International Congress on Diseases of the Chest
Cologne, Germany, 19-23 August 1956

The Fourth International Congress on Diseases of the Chest of the American College of Chest Physicians will be held in Cologne, Germany, from 19 to 23 August 1956 under the patronage of the Federal Chancellor Dr. Konrad Adenauer, Previous Congresses have been held in Rome, Rio de Janeiro, and Barcelona. Eighty-six countries will send representatives.

The principal subjects of discussion will be problems of coronary diseases, industrial diseases of the chest, tuberculosis, lung and heart function, and tumors of the mediastinum. This year's Congress will have special reference to the surgery of coronary diseases. The presentations will be followed by free discussion. Official languages for the Congress are: English, French, Spanish, and German.

Prof. Gerhard Domagk will be the President, Prof. J. Jacobi the General Secretary, and Prof. J. Hein the Chairman of the Executive Committee.

More detailed information may be obtained from the secretariat of the Congress: Fourth International Congress of the American College of Chest Physicians, Köln-Deutz, Germany, Messeplatz.

Promotions of Officers

The following officers of the military medical services on active duty in the Army, Navy, and Air Force have recently received temporary promotions to the rank indicated.

MEDICAL CORPS

ADYE, Wallace M., Jr., Capt., USAF
ALDRED, Allen W., Lt., USN
ALECCE, Paul M., Lt., USN
ALLEN, Frank F., Lt. Comdr., USN
ALLIS, Edward K., Jr., Capt., USN
ARJE, Sidney L., Capt., USN
ARMINGTON, Fred W., Capt., USN
ASH, Henry T., Comdr., USN
BACON, Joseph C., Comdr., USN
BAILEY, William T., Jr., Lt. Comdr., USN
BAKER, William B., Lt., USN
BALLENGER, Felix P., Capt., USN
BAMBERG, Paul G., Lt. Comdr., USN
BARNARD, Robert, Lt. Comdr., USN
BARNHILL, Bruce B., Comdr., USN
BARSS, Joseph A., Lt. Comdr., USN
BARTON, Robert K., Lt. Comdr., USN
BASCH, Michael F., Lt., USN
BAUMAN, Billy J., Capt., USAF
BAUSMAN, Charles H., Jr., Capt., USAF
BERMAN, Arthur D., Lt., USN
BETANCE-CAMPORA, L. J., Lt. Comdr., USN
BEUERMAN, Virgil A., Capt., USN
BLACK, Paul E., Comdr., USN
BLUHM, Gilbert B., Lt., USN
BOLAND, John D., Capt., USN
BOVE, Louis, Capt., USAF
BOYCE, Charles R., Lt., USN
BRADY, Wayne C., Lt. Comdr., USN
BRATENAHL, Charles G., Comdr., USN
BREAKEY, Barry A., Lt., USN
BREST, Albert, Lt., USN
BROOKS, Robert H., Col., USAF
BROWN, Robert H., Comdr., USN
BRUGGER, Ralph M., Capt., USAF
BRYAN, Frank M., Lt. Comdr., USN
BURKLE, Joseph S., Comdr., USN
BURKLEY, Louis F., III, Lt. Comdr., USN
CAPUTO, Isadore A., Capt., USAF
CARLSON, Carl P., Comdr., USN
CARLSON, Frederick B., Capt., USN
CARTER, Norman W., Lt., USN
CARTER, Roy E., Capt., USAF
CHALLENER, William A., III, Capt., USAF
CHENAULT, Sidney B., Capt., USAF
CHRISTIANSEN, David V., Lt. Comdr., USN
CHRISTY, Ralph L., Jr., Capt., USN
CLARKE, Francis M., Jr., Lt., USN
CLOMIE, Charles F., Jr., Comdr., USN
COHEN, Jerome, Capt., USAF
COHEN, Sidney H., Comdr., USN
CONLEY, John L., Capt., USN
COOPERSMITH, Richard C., Capt., USAF
CORNFELD, Joseph, Capt., USAF
CRUE, Benjamin L., Jr., Lt. Comdr., USN
CRUFT, George E., Lt. Comdr., USN
CUNNINGHAM, Robert F., Capt., USAF
DALY, Roswald B., Lt. Comdr., USN
DANEMANN, Hershel A., Capt., USAF
DAVIS, Robert L., Lt. Comdr., USN
DEAN, Robert M., Capt., USAF
DELANEY, Thomas B., Lt. Comdr., USN
DEMPSEY, John J., Lt. Comdr., USN
DILLON, James R., Jr., Capt., USN
DOBBIE, Robert P., Jr., Lt. Comdr., USN
DOBERT, Philip R., Lt. Comdr., USN
DOBKIN, Joseph J., Lt. Col., USAF
DOBYNS, James H., Maj., USAF
DOOLAN, Paul D., Lt. Comdr., USN
DRUMMOND, N. Robert, Col., USAF
DUANE, George W., Capt., USAF
EGAN, John T., Jr., Comdr., USN
ELY, Thomas S., Lt. Comdr., USN
ENGLE, Paul R., Capt., USN
ENGLEHART, Charles E., Col., USAF
ERICKSON, Laverne S., Capt., USAF
ESPEY, James G., Jr., Col., USAF
EVANS, Charles B. S., Col., USAF
EYE, Harry L., Lt., USN
FALVO, Samuel C., Capt., USAF
FARRELL, Francis D., Maj., USAF
FARRER, John F., Capt., USAF
FERNANDES-DURAN, Guillermo, Capt., USAF
FERRY, Andrew P., Capt., USAF
FINN, Thomas E., Capt., USAF
FISHER, Gordon F., Lt. Col., USAF
FITZPATRICK, Mark J., Capt., USAF
FLANAGAN, John F., Capt., USAF
FLECK, Robert L., Comdr., USN
FLORENCE, Lewis, Capt., USAF
FOOTE, John A., Capt., USAF
FOX, Marvin I., Lt., USN
FRANKE, Glenn H., Lt., USN
FREIBURGER, Donald S., Lt., USN
FRIEMAN, Sylvan, Capt., USAF
FUGITT, Elmer W., Col., USAF
FULLER, Roger H., Capt., USN
GADD, Duwayne D., Lt. Comdr., USN
GEORGE, Frederick W., III, Lt. Comdr., USN
GILLESPY, Robert R., Jr., Lt. Comdr., USN
GINTER, George C., Jr., Capt., USAF
GOODMAN, Erastus G., Comdr., USN
GRAVES, William H., III, Lt., USN
GRAYSON, Ted L., Lt., USN
GREEN, Cyrus T., Lt., USN
GREEN, Richard S., Capt., USAF
GRUNWELL, John R., Jr., Col., USAF
GUINN, Edgar L., Capt., USAF
HAGENEY, Harry M., III, Capt., USAF
HALL, Clifford R., Comdr., USN
HALL, William J., Capt., USN
HANSEN, Wayne S., Capt., USN
HARR, Ellis U., Capt., USAF
HAWKS, Byrun L., Capt., USN
HENDERICKSON, Russell R., Lt., USN
HENDERSON, William W., Capt., USN
HERING, Alexander C., Comdr., USN
HERSH, David H., Capt., USN
HORNING, David J., Lt., USN
HOSP, David H., Lt. Comdr., USN
HOTTENSTEIN, David F., Capt., USN
HOYT, Charles S., Capt., USAF
HUDGENS, Robert O., Lt., USN
HUDSPETH, Allen S., Capt., USAF
HUMPHRIES, Joseph E., Capt., USN
HUTCHINSON, Glenn D., Capt., USN
HYATT, George W., Comdr., USN
KAYE, Maxwell E., Comdr., USN
KEATING, James L., Lt. Comdr., USN
KEELER, William H., III, Capt., USAF
KELLEY, Joseph F., Capt., USAF
KELLY, Richard E., Capt., USN

KIMBALL, Glenn J., Lt., USN
KIRKLAND, Theodore N., Jr., Lt. Comdr., USN
KIRSCHBAUM, Thomas H., Lt., USN
KOELLIKER, Joseph W., Jr., Capt., USAF
KOROSEC, Blaz, Lt. Comdr., USN
KRAYNICK, Benjamin M., Lt., USN
KULCZYCKI, John, Jr., Col., USAF
KWIATKOWSKI, Peter S., Capt., USN
LADNER, William, Capt., USAF
LAMOTHE, Isidore J., Jr., Capt., USAF
LAMPROS, George W., Lt., USN
LANEVE, Samuel A., Capt., USAF
LAUFENBURG, Herbert F., Lt., USN
LAWRENCE, Richard, Jr., Capt., USN
LEHMAN, Robert C., Comdr., USN
LEHRER, Harold, Lt., USN
LESTER, Richard L., Jr., Lt., USN
LINEHAN, Francis J., Jr., Lt. Comdr., USN
LIPPINCOTT, Charles A., Comdr., USN
LIVINGOOD, William C., Capt., USN
LORING, Marvin F., Lt. Comdr., USN
LOWE, Norman, Lt., USN
LOWEECEY, Edward D., Lt. Comdr., USN
LOWREY, Douglas H., Capt., USAF
LOWRY, Elmer F., Jr., Comdr., USN
LUNG, Ronald R., Lt., USN
MAHONEY, David I., Jr., Maj., USAF
MARKWOOD, Carl C., Capt., USAF
MARSHALL, Charles B., Maj., USAF
MARTINEZ, Carlos B., Lt. Comdr., USN
MASON, Alfred B., Comdr., USN
MATSUDA, Arthur T., Lt., USN
McCASLIN, Frank E., Jr., Lt., USN
McCULLOUGH, Francis H., Jr., Comdr., USN
McELKENNEY, Thomas R., Capt., USAF
McGARY, Lester E., Jr., Capt., USAF
McKAY, Ernest G., Lt. Comdr., USN
McLAUGHLIN, James A., Comdr., USN
McLEOD, Deane E., Lt. Comdr., USN
MEAD, Allen W., Lt., USN
MEARS, Claud M., Col., USAF
MENDEL, Gerald A., Capt., USAF
MERKLE, Vernon J., Lt. Comdr., USN
MESSERSMITH, John L., Capt., USN
MILLER, Harold L., Lt., USN
MILLER, Joseph A., Capt., USAF
MILLER, Lloyd F., Comdr., USN
MILLS, Dawson A., Capt., USN
MINARD, David, Comdr., USN
MOELLER, Ernst R., Capt., USN
MONES, Robert J., Lt., USN
MOORE, Donald B., Capt., USAF
MORAN, Charles E., Capt., USN
MORGAN, Francis M., Comdr., USN
MORRIS, Neal, Capt., USN
MORRIS, William E., Comdr., USN
MOULTON, Keith B., Lt., USN
MOXON, Robert K., Comdr., USN
MUGRAGE, Ralph M., Capt., USN
MULLIN, Raymond J., Jr., Capt., USAF
MURPHY, John M., Capt., USN
MYKOFF, David J., Capt., USAF
NAY, Newell, Capt., USN
NELL, Edward R., Comdr., USN
NELSON, Frank F., Capt., USAF
NORTON, John A., Col., USAF
NUNNALLY, Lester C., Capt., USAF
OCHOA, Gonzalo G., Lt. Comdr., USN
OSTAPOWICZ, Frank, Lt. Comdr., USN
PALMER, Harold V., Comdr., USN
PANNER, Bernard, Lt., USN
PASCOE, Delmer J., Lt. Comdr., USN
PAST, Si A., Jr., Capt., USAF
PATTERSON, Roy R., Maj., USAF
PEABODY, Sherman M., Capt., USN
PEARSON, John K., Capt., USAF
PEFFLY, Elmer D., Capt., USAF
PENINGTON, Robert, Jr., Capt., USN
PENTON, Arthur, Jr., Capt., USAF
PERUCCA, Leo G., Lt., USN
PETERJOHN, Harlan R., Lt., USN
PETERS, Earl R., Lt. Comdr., USN
PHILIE, Henry J., Jr., Capt., USAF
PIROTTE, Richard A., Lt., USN
PRESTON, Frank R., Lt. Comdr., USN
RAFTERY, Alan, Comdr., USN
RANDEL, Harvey C., Lt. Comdr., USN
REDMON, Agile H., Jr., Lt., Comdr., USN
REINHARDT, Roger F., Lt. Comdr., USN
RESNICK, Nolan, Capt., USAF
RICCIUTTI, Vincent, Capt., USAF
ROBINSON, Donald W., Comdr., USN
ROSENBERG, Saul A., Lt., USN
ROUKEMA, Richard W., Lt., USN
ROWBERG, Raymond G., Lt. Comdr., USN
ROY, Gustave A., Capt., USN
RUPNIK, Edward J., Lt. Comdr., USN
SANTIAGO, Miguel, Capt., USAF
SANTIAGO, Stevenson S., Comdr., USN
SARVER, Richard B., Lt. Comdr., USN
SCHMITZ, Everett J., Comdr., USN
SCHULTE, John H., Lt. Comdr., USN
SCHULTZ, Russell T., Lt., USN
SCHWARTZ, Ernest, Capt., USAF
SEBRECHTS, Paul H., Lt. Comdr., USN
SERENATI, Quintin J., Col., USAF
SHAUL, John F., Capt., USN
SIEGEL, Charles I., Lt., USN
SILL, John T., Capt., USN
SILLERY, William R., Lt. Comdr., USN
SIMONS, Julio S., Capt., USAF
SKLAR, Jordan J., Lt., USN
SMITH, Bobby L., Capt., USAF
SMITH, Eugene B., Lt. Comdr., USN
SMITH, Lawrence W., Lt. Comdr., USN
SMITH, Myron R., Capt., USAF
SMITH, Robely D., Capt., USAF
SMITH, Thomas W. D., Lt. Comdr., USN
SNYDER, William A., Lt. Comdr., USN
STECKLER, Paul P., Lt., USN
STEINER, Leon E., Lt. Comdr., USN
STEINKAMP, George R., Lt. Col., USAF
STOCKER, George E. F., Capt., USN
STONER, Max A., Capt., USAF
STRECK, Fletcher W., Lt. Col., USAF
STROUD, Clyde S., Jr., Capt., USN
STUTSMAN, Robert E., Capt., USN
TARGGART, William H., Lt., USN
THELEN, Emil P., Comdr., USN
THOMAS, William L., Lt. Comdr., USN
TOWNSEND, Frank M., Col., USAF
TRIER, William C., Lt. Comdr., USN
TROY, John W., Lt. Comdr., USN
TURVILLE, William C., Comdr., USN
TYBURCZY, Joseph A., Capt., USN
URBAN, Clifford H., Lt., USN
VANETTEN, Chester L., Col., USAF
VETTER, John S., Capt., USAF
VORIS, Frank B., Capt., USN
WALDRON, John F., Lt., USN
WALKER, James W., Lt., USN
WARD, Donald C., Lt. Comdr., USN
WATERS, Wayne W., Capt., USN
WATTEN, Raymond H., Lt. Comdr., USN
WATTS, Charles C., Jr., Maj., USAF
WEDEN, Elmer A., Jr., Lt. Comdr., USN
WEINRAUCH, Harry, Capt., USAF
WHITE, Henry C., Lt., USN
WHITE, Neil V., Lt. Comdr., USN
WIEDLIGHT, Seymour, Lt. Col., USAF

WILLIAMS, Clin C., Jr., Capt., USAF
WILLIS, Stanley E., II, Lt. Comdr., USN
WILMER, Harry A., Comdr., USN
WINGARD, Christian, Lt. Comdr., USN
WOODRUFF, William E., Comdr., USN
WOODWORTH, Fernando S., Capt., USAF
ZIMMER, Roy W., Jr., Capt., USAF
ZWEIFLER, Andrew J., Capt., USAF

DENTAL CORPS

ABBOTT, Paul L., Lt., USN
AINLEY, James E., Jr., Lt., USN
ANDREWS, Wallace S., Comdr., USN
APPLEGATE, Donald E., Lt., USN
ASCHER, Stanley S., Maj., USA
BAKER, Howard, Capt., USAF
BAKER, Roger J., Lt., USN
BARR, Charles E., Lt., USN
BASS, Joe K., Lt., USN
BAXTER, Donald H., Capt., USAF
BEAUVAIS, Hewit J., Jr., Comdr., USN
BERKWITZ, Morrey, Lt., USN
BERLAD, Solomon J., Maj., USA
BINGHAM, Charles V., Maj., USA
BRENNER, James H., Lt., USN
BROUILLETTE, Joseph N., Lt., USN
BRYANT, Vernon G., Lt., USN
CAHILL, James M., Lt., USN
CHURAN, Joseph S., Maj., USA
COLGAN, Edward J., Lt., USN
CONANT, Julian R., Comdr., USN
COOPER, Richard G., Comdr., USN
COULTER, George M., Lt., USN
CRAWFORD, Jack G., Lt., USN
DAMPF, Roy W., Lt., USN
DANNE, Arthur J., Lt., USN
DARNALL, William L., Jr., Comdr., USN
DEINES, Dean A., Maj., USA
DESCHENES, Donald L., Lt., USN
DOBRONTE, Frank, Comdr., USN
DODGE, Charles A., Comdr., USN
DOUGHERTY, Lewis W., Jr., Lt., USN
DUBROW, Jacob R., Capt., USAF
DUNCAN, Elmer T., Capt., USAF
EIDEN, Eugene F., Capt., USAF
EINHORN, Bernard I., Lt., USN
ELWELL, Kenneth R., Col., USAF
EUBANK, Dillard P., Jr., Comdr., USN
FECHER, Con J., Jr., Capt., USAF
FERRY, John M., Lt., USN
FIELDS, Robert E., Lt., USN
FLEUCHAUS, Philip T., 1st Lt., USAF
FLOOD, Jack F., Comdr., USN
FRANCIS, Jack C., Lt., USN
FUNKHOUSER, Donald A., Lt., USN
GARRISON, Edgar L., Capt., USAF
GARTON, William C., Comdr., USN
GEER, John F., Maj., USA
GRANGER, Ronald G., Lt., USN
GRAY, Gus W., Comdr., USN
GUAY, Edward T., Comdr., USN
HALL, Cecil B., Capt., USAF
HALLSTEAD, Richard, Lt., USN
HALSTEAD, Charles L., Lt., USN
HAMILTON, Martin R., Comdr., USN
HANSON, Thomas J., Comdr., USN
HARMON, Carlos B., Maj., USA
HASS, Albert P., Comdr., USN
HATCHETT, Charles M., Jr., Capt., USAF
HEALY, John H., Maj., USA
HECHT, Leon J., Lt., USN
HELLERMAN, Leonard P., Lt., USN
HENNER, Sidney H., Capt., USAF
HINZE, Lowell A., Lt., USN
HODGE, Douglas R., Lt., USN
HODGSON, Gerald L., Comdr., USN
HOLLAND, Joseph A., Lt., USN
HONICK, Henry, Jr., Lt., USN
HOUSE, Ernest E., Maj., USA
HRUBY, John P., Lt., USN
HUBER, William C., Lt., USN
HUBERWALD, August R., Col., USAF
HUGHES, Winfree, Comdr., USN
HURT, William C., Maj., USA
HYATT, Don D., Lt., USN
JENNINGS, John K., Jr., Lt., USN
JENNINGS, Robert M., Lt., USN
JOBE, John T., III, Lt., USN
JOHNSON, Joseph M., Lt., USN
JONES, Preston M., Capt., USAF
JUNG, Elmer F., Jr., Capt., USAF
JUNKER, Winnbert D., Capt., USAF
KASTNER, Robert H., Lt., USN
KEELS, Cameron H., Jr., Lt., USN
KEENAN, James F., Comdr., USN
KEISTER, Earl L., Jr., Lt., USN
KEITH, Donald J., Lt., USN
KELLEY, John F., Lt., USN
KENNEY, Gordon A., Lt., USN
KING, William W., Jr., Lt., USN
KNOT, William H., III, Lt., USN
KNOWLES, Thurston D., Comdr., USN
KOENIG, Albin J., Comdr., USN
KRAAS, Benjamin M., Lt. Col., USAF
KRASKE, Leonard M., Comdr., USN
KUFFREY, Clyde E., Lt., USN
KUNTZ, Paul E., Lt., USN
KUOUZIAN, Kersam K., Comdr., USN
LANIER, Harold S., Jr., Lt., USN
LARSON, Gilb H., II, Comdr., USN
LECLUSYSE, Edward L., Lt., USN
LEE, William T., Maj., USA
LEGGIO, Vincent, Capt., USAF
LEVIN, Donald L., Capt., USAF
LITTLE, Earl E., Jr., Lt., USN
LOOPER, Joseph W., Lt., USN
MARKING, William M., Comdr., USN
MARTENS, Robert L., Capt., USAF
MAY, Reuel, Jr., Capt., USAF
McDONALD, Edward D., Comdr., USN
McKEE, Reuben W., Jr., Comdr., USN
McMANUS, Thomas A., Jr., Lt., USN
MEEKS, James E., Jr., Capt., USAF
MILLARD, Robert J., Maj., USA
MILLER, Dayton, Jr., Maj., USA
MILLER, Edward F., Capt., USAF
MITCHELL, Edward C., Comdr., USN
MORELLI, Ernest J., Capt., USAF
MOURADIAN, William F., Capt., USAF
NESSLEIN, Louis W., Lt., USN
NESTING, Henry M., Lt., USN
NICAUD, Wallace M., Jr., Lt., USN
NICHOL, Bernard E., Lt., USN
NIEBUHR, Robert M., Lt., USN
NOBLE, Alvin B., Comdr., USN
NORRIS, Russell S., Maj., USA
OGILVIE, Leslie C., Lt., USN
OSADA, Takeshi, Capt., USAF
PARRISH, Cecil O., Comdr., USN
PENNINGTON, James F., Comdr., USN
PERRYMAN, George L., Jr., Lt., USN
PETERS, James W., Lt., USN
PINARD, Monty P., Lt., USN
POOL, William L., Lt., USN
PRICE, Delbert D., Maj., USA
PROFITA, Carlo J., Capt., USAF
RICE, William T., Comdr., USN
RILL, Charles A., Comdr., USN

DENTAL CORPS—Continued

ROLAND, William R., Lt., USN
ROSENBERG, Herbert D., Maj., USAF
RUDAN, Thomas W., Lt., USN
RUPP, Nelson W., Comdr., USN
SAIN, Joe A., Capt., USAF
SANBORN, Howard P., Lt., USN
SELBY, Stephen M., Lt., USN
SEYMOUR, Wilbern B., Lt., USN
SMALL, Gilbert S., Lt., USN
SMITH, Ian M., Capt., USAF
SMITH, John A., Lt., USN
SMITH, John H., Comdr., USN
SMITH, Winthrop F., Comdr., USN
STAKER, Donald E., Lt., USN
STINES, Virgil L., Maj., USA
TENCA, Joseph L., Lt., USN
TESHER, Frederick K., Lt., USN
THOMAS, William M., Lt., USN
TIPPIN, Joseph G., Jr., Comdr., USN
TURNER, Charles E., Maj., USA
TYLER, John C., Comdr., USN
VANAMAN, Nathan E., Maj., USA
VANDAMM, Vincent W., Comdr., USN
WARREN, Ross W., Maj., USA
WELD, Donald L., Lt., USN
WEST, Frank M., Jr., Lt., USN
WHITE, Paul C., Comdr., USN
WHITTEMORE, Robert Y., Jr., Maj., USA
WILAMOWSKI, Edward E., Jr., Capt., USAF
WILLIAMS, Claude R., Lt., USN
WITTHOFFT, Walter F., Comdr., USN
WYCOFF, Samuel J., Lt., USN

MEDICAL SERVICE CORPS

BAHR, Donald W., 1st Lt., USAF
BARFIELD, Aaron H., 1st Lt., USAF
BARFIELD, Acie C., 1st Lt., USAF
BAUMER, Chester J., 1st Lt., USAF
BOYCE, James M., 1st Lt., USAF
BUTLER, Henry M., Col., USAF
CALORE, Joseph E., 1st Lt., USAF
CHEEK, Russell C., Lt. Col., USAF
CHITWOOD, Lawrence A., 1st Lt., USAF
COLE, Malcolm A., 1st Lt., USAF
COVELL, Donald F., Capt., USAF
CUNNINGHAM, William J., 1st Lt., USAF
CURTIN, Thomas J., Maj., USAF
DIBONA, Joseph, Capt., USAF
DOMANSKI, Thaddeus J., Col., USAF
DURDEN, John A., Jr., 1st Lt., USAF
ELLER, Richard W., 1st Lt., USAF
FREDERIKSEN, Charles F., 1st Lt., USAF
FREELAND, John C., Jr., 1st Lt., USAF
FUCCILLO, David A., 1st Lt., USAF
GOLIN, Jerome F., 1st Lt., USAF
GOOSTREE, Paul R., 1st Lt., USAF
GULLEY, Wayne E., Capt., USAF
HANKS, Charles T., 1st Lt., USAF
HARTLEY, James E., 1st Lt., USAF
HARTMAN, Hugh A., 1st Lt., USAF
HILL, Albert E., Capt., USAF
HUNT, Clyde T., Capt., USAF
HUTCHINSON, Frank L., Capt., USAF
IPPOLITO, Joseph W., 1st Lt., USAF
KELLER, Paul C., Lt. Col., USAF
KINNEY, Joe E., Col., USAF
KIRKEL, Hubert F., Capt., USAF
MULLIN, Paul E., Capt., USAF
OGREN, Richard C., 1st Lt., USAF
PARADA, Armand R., 1st Lt., USAF
PAYNE, Jack L., 1st Lt., USAF
PRICE, William B., Jr., Capt., USAF
SARRATT, Dale W., 1st Lt., USAF
SHAW, Emil G., Capt., USAF
SIEGEL, Lawrence, 1st Lt., USAF
THAXTON, Harold D., Maj., USAF
WILLS, Billy S., 1st Lt., USAF
WISNOSKI, Charles S., Capt., USAF

NURSE CORPS

BARBEE, Janett B., Capt., USAF
BRITTEN, Rose M., Capt., USAF
BROOKS, Louisa F., Lt., USN
CARSON, Rita D., 1st Lt., USAF
CASEY, Jackie M., Capt., USAF
CLEMONS, Hilda C., Lt., USN
CORCORAN, Anna, Lt., USN
CORDINGLEY, Mary K., Lt., USN
DALY, Hazel L., Capt., USAF
DAVIS, Elizabeth M., Capt., USAF
DOHERTY, Eleanor M., Lt., USN
DONNELLY, Elizabeth M., Lt., USN
FELLERS, Mary L., Lt., USN
FREESE, Ellen J., Lt., USN
GAGNON, Eva M., Lt., USN
GALLAGHER, Mary J., Lt., USN
GARCIA, Marie D., 1st Lt., USAF
HAMBLETON, Dona L., 1st Lt., USAF
HARRIS, Claudia M., Capt., USAF
JONKE, Paula C., Lt., USN
KAEGI, Helen E., Lt., USN
LESSLIE, Mary J., Lt., USN
LUND, Betty A., Capt., USAF
MALEY, Barbara A., Lt., USN
MARSCH, Martha T., Capt., USAF
MASON, Martha J., 1st Lt., USAF
McCRAY, Hattie L., 1st Lt., USAF
McFALL, Eleanor L., Capt., USAF
MEADOWS, Marjorie H., Capt., USAF
MEYER, Dorothy E., Capt., USAF
MILLER, Jean L., Lt., USN
MILLS, Meta M., Capt., USAF
MONTRONE, Minnie B., Capt., USAF
MORRISON, Carol L., Lt., USN
MURPHY, Lorraine M., Lt., USN
MYERS, Jean C., Capt., USAF
NEVERS, Rose A., Lt., USN
ODONNELL, Georgia M., Capt., USAF
OLNEY, Marilyn A., 1st Lt., USAF
PARENT, Shirley M., Lt., USN
PERLOW, Marion R., Lt., USN
PERRY, Sara H., Capt., USAF
PFEFFER, Elizabeth M., Lt., USN
POTTER, Dorothy A., Capt., USAF
QUINTINI, Audre A., Maj., USAF
REYES, Lucia, Lt., USN
RUSSO, Anita C., Lt., USN
SEABURY, Marion M., Lt., USN
SEFCHOK, Ann, Lt., USN
SHAIN, Willa J., Capt., USAF
SHARLAND, Pauline R., Lt., USN
SHELLEY, Rita J., Lt., USN
SHERVANIAN, Anna E., Lt., USN
SIMMEL, Naoma C., 1st Lt., USAF
STIPE, Gloria J., Lt., USN
STITZGERALD, Marion, Capt., USAF
STONE, Charlotte R., Lt., USN
SULLIVAN, Irene A., Lt., USN
THOMAS, Patricia A., Capt., USAF
TYRRELL, Joan M., Lt., USN
VAN HAM, Louanne, 1st Lt., USAF
WARNER, Mary C., Capt., USAF
WONSEWICZ, Geraldine T., 1st Lt., USAF
YORK, Rita, Lt., USN

Reviews of Recent Books

A TEXTBOOK OF CLINICAL PATHOLOGY, edited by *Seward E. Miller,* M. D. 5th edition. 1,208 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1955. Price $11.

This comprehensive book on clinical pathology was formerly edited by Kracke and Parker. Dr. Miller became editor after publication of the third edition, and he is assisted by nine contributors. Dr. L. W. Diggs of the University of Tennessee has written the chapters on the examination of the blood as concerns hemoglobin, erythrocytes, leukocytes, reticulocytes, thrombocytes, prothrombin, and fibrinogen, and on examinations related to the anemias, erythrocytosis, hemoglobinemia, and hemorrhagic and thromboembolic diseases. Dr. I. Davidsohn of the Chicago Medical School and Mount Sinai Hospital covers the leukemias and other diseases affecting leukocytes as well as the difficult subject of the blood groups. Doctors Cohn and Kaplan of the Michael Reese Hospital in Chicago have written the chapters on blood chemistry and tests for hepatic function. Dr. Milzer of the same hospital is the author of chapters on the assay of chemotherapeutic and antibiotic agents and on the diagnosis of viral and rickettsial diseases, and a new chapter on medical bacteriology. The editor has written new chapters on parasitology and the examination of seminal fluid and feces as well as the chapters on serology, examination of cerebrospinal fluid, saliva, sputum, gastric and duodenal contents, urine, and tests of renal function.

Dr. Emmerich von Haam of Ohio State University is the author of chapters on the assay of vitamins and hormones, the examination of transudates, exudates, the skin and mucous membranes, and the diagnosis of venereal lesions. Dr. McBurney of the Medical College of Alabama has contributed a chapter on immunologic tests such as agglutination, precipitin, and complement-fixation procedures.

New contributors to this edition are Doctors Emma Moss and Albert McQuown of Louisiana State University who have written a chapter on medical mycology.

The book is designed to assist the physician in knowing what tests to request; when, in the course of a disease, to request them; and how to interpet the report. Because of this the details of laboratory procedures are in some cases omitted, but appropriate references are cited. The chapter on blood chemistry, for example, contains no procedures. In many of the sections, however, procedures are detailed, as for example the chapter on blood technics, parasitology, immunologic tests, bacteriology, and examinations of cerebrospinal fluid, transudates and exudates, gastric and duodenal contests, and urine In general those tests which are commonly performed by the interne, resident,

or practicing physician are given in detail, while procedures usually performed by highly trained technical personnel such as those in the field of chemistry and serology are omitted.

Because the authors emphasize the bases and interpretations of laboratory diagnostic procedures this book is useful to the clinician as well as to the clinical pathologist. All sections are well written and there are numerous illustrations. Each chapter has an extensive bibliography. This fifth edition will no doubt prove as popular as previous editions. —*HUGH R. GILMORE, Jr., Col., MC, USA*

THE BODY FLUIDS, Basic Physiology and Practical Therapeutics, by *J. Russell Elkinton*, M. D. and *T. S. Danowski*, M. D. 626 pages; illustrated. Williams & Wilkins Co., Baltimore, Md., 1955. Price $10.

In one volume the authors have summarized the present voluminous material in this important field. The organization of the book is excellent in that the material is presented under four main heads, namely "Basic Physiology," "Basic Principles as Common Denominators in Clinical Situations," "Disease Entities," and "Clinical Dicta and Practical Therapeutics." In addition, an appendix outlines one procedure for balance studies.

The authors frankly admit that "intelligent fluid therapy is a matter of trial and error." They have drawn on both their vast experience and that of many others in an attempt to clarify a subject confusing to many. They point out that much is yet to be learned but that this volume is intended to present what has been learned and accepted up to the present time, and they acknowledge the fact that there is some variance in interpretation of the accumulated knowledge.

The book is well illustrated with graphs, charts, and tables. It contains many formulas of solutions to be considered in treatment of the patients with both normal and abnormal regulatory mechanisms. It emphasizes the principles to be considered in selecting the proper therapeutic approach for specific disease entities.

The research worker in this field will find this book of value both because of its contents and because of the extensive references at the end of each chapter. The clinician will find value in the practical application of the principles so well defined and discussed. This work is recommended for all medical libraries and for all physicians.

—*PAUL S. FANCHER, Col., MC, USA*

CARDIAC DIAGNOSIS, A Physiologic Approach, by *Robert F. Rushmer*, M. D. 447 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955.

Within relatively few pages, considering the extensive scope of the material presented, this book describes and correlates in concise, readable, and comprehensible form the current and fundamentally complete physiologic principles directly applicable to clinical cardiac diagnosis.

The book is well integrated and is organized into five parts. Part One describes the functions of the normal cardiovascular system and emphasizes that the heart is but an integral part of the entire circulatory system. Part Two concerns the regulation of the cardiovascular system and the adjustments of the heart and peripheral vessels in response to constant and varying demands. Chapters on cardiac reserve and the etiology of congestive failure are presented in another section, which reviews the concepts of mechanisms involved in congestive failure. Part Four clearly and in sufficient detail describes those methods and observations necessary for the recognition of cardiovascular abnormalities. Finally, the fifth section applies the basic physiologic principles to the diagnosis of cardiac disease.

A textbook of this type has been needed, it merits immediate approval, and there is full agreement with the author who feels it is intended for students of medicine in the broadest sense; from first year medical students to experienced physicians." This book should be readily available to all medical students, interns, and residents, and would be an asset to any medical library.

Illustrations are profuse, relevant, and a tremendous aid in rapid orientation. Each chapter has an extensive and current bibliography, and the book itself is well indexed.

—*JOHN H. WARD, Jr., Capt. (MC) USN (Ret.)*

DISORDERS OF CHARACTER, Persistent Enuresis, Juvenile Delinquency and Psychopathic Personality, by *Joseph J. Michaels*, M. D. 148 pages. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $4.75.

This volume contains a symposium of articles written by the author over an 18-year period. The papers have been arranged in such a way as to attempt to present statistical data, a review of pertinent literature, a conception of the relationship of enuresis and the electroencephalogram to neurotic and antisocial traits of character and behavior disorders of children, and finally an evaluation of the data in terms of psychoanalytic and psychobiologic concepts. Implications for treatment and research suggested by the complete study are discussed, and a brief but adequate summary gives the collection of papers a more homogeneous perspective than initially grasped when read in sequence.

It is this reader's opinion that the author has made valuable observations concerning the multiple facets of an important social and medical problem. It seems probable that the observations might represent a more significant contribution to the field of personality development and character disorder if all of the original papers per se had not been used but rather had been reorganized to present the ultimately essential data of the papers. Many readers, I believe, will be misled by the title which seems inappropriate to the several ideas considered in the volume. The author's argument and plea for a holistic approach to the study of character, its development, and deviations is whole-heartedly concurred in by this reviewer.—*JULIEN C. KENNEDY, Lt. Col. MC, USA*

ESSENTIALS OF BIOLOGICAL AND MEDICAL PHYSICS, by *Ralph W. Stacy*, Ph. D., *David T. Williams*, Ph. D., *Ralph E. Worden*, M. D., and *Rex O. McMorris*, M. D. With an Introduction by *Otto Glasser*, Ph. D., F. A. C. R. 586 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $8.50.

This book is the first text written specifically for students in the rapidly expanding field of biophysics. This statement alone dramatizes an appreciation of the growing requirements for teaching the essentials of biophysics to our nation's medical and biology students. The facts of modern medical developments necessitate an appreciation of these concepts by the civilian practitioner, and are essential for an understanding of the varied military problems faced daily by the military surgeon.

The book is divided into 10 parts covering fundamental concepts, mechanical systems, heat thermodynamics, bio-acoustics, light, the physics of gas and fluids, electrical systems, nuclear reactions, and a few aspects of theoretic biophysics. Each part is directed to an understanding of practical problems, and in addition to established principles, points out some of the variables and unknowns. Some of the subjects serve as a review of physiology, but the data are presented from a slightly different approach which is perhaps more concise. The author assumes the reader has a basic knowledge of mathematics including differential equations, but these are presented in such a way that a little concentration should result in familiarity with their use and application.

In addition to recommending this book as a basic text for physicians and biologists confronted with biophysical problems, I think that military medical planners will welcome the teaching of this material in our schools as the graduates will be far better prepared for the problems presented by military medicine in our increasingly complicated world.—*JAMES B. HARTGERING, Lt. Col., MC, USA*

ROOT CANAL THERAPY, by *Louis I. Grossman*, D. D. S., Dr. med. dent., F. A. C. D. 4th edition. 399 pages; 347 illustrations on 140 figures, 1 in color. Lea & Febiger, Philadelphia, Pa., 1955. Price $7.50.

This textbook is a comprehensive guide for treatment and diagnosis in the field of endodontia. Dr. Grossman has furnished the undergraduate student and practicing dentist with a good and simple reference for the treatment of vital and pulpless teeth.

The author thoroughly discusses the early and modern trends in this controversial area of general dentistry. His discussion of focal infection gives the dental profession an honest appraisal of a much discussed and poorly understood subject.

The text is adequately illustrated, with black and white photographs, drawings, radiographs and sketches, and written in a manner that is self-explanatory to the dentist using it as a reference. All the modern

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information on the subject of root canal therapy is comprehensively covered. The section devoted to antibiotics is comprehensive and practical, and the technic of root resection and surgical approach of endodontia is graphically presented.

The chapter on instrumental and technical procedures is invaluable to the dentist. As a result of root canal treatment, many teeth become discolored. Dr. Grossman's bleaching of discolored teeth furnishes a good esthetic result.

The author should be complimented on this excellent reference book which should be a part of the library of all progressive dentists.

—WILLIAM W. SENN, Lt. Col., USAF (DC)

PSYCHOLOGY OF INDUSTRIAL BEHAVIOR, by *Henry Clay Smith.* 477 pages. McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $6.

The author, Associate Professor of Psychology at Michigan State University, has written a stimulating new book concerning a subject (psychology) that deals with material as ancient as the human race and discussing its application to modern industry. This relationship is a fairly recent development and one well worth the attention of industrial management, from group supervisors to top level executives. I believe the book has the most to offer to the industrial relation department, especially the personnel branch, of a company; but seriously doubt if many physicians who limit their practice to occupational medicine will find the time to thoroughly peruse this work. Indeed, the author professes that it is a text-book for psychology students, but hopes that it will be profitable for industrialists as supplemental reading, and helpful in planning training programs.

Professor Smith has propounded the not entirely new idea that the psychologist is to an industry what a physician is to a patient. He stresses the fact that psychology as applied to industrial behavior, in its aim to improve human relationships, lacks certain validity of method, and attributes this defect to the lack of research and of statistically significant proof that a certain action applied to a given situation will result in the desired change.

Almost two thirds of the book is given over to discussion of the results of psychologic investigation, and one third is devoted to the various psychologic methods and technics used to obtain these results. The author lays considerable emphasis on the fact that technical and mechanical difficulties are readily analyzed and solved by scientific engineering, but that human problems, which are considerably more complex, have not been scientifically studied sufficiently to allow similar solution. He contends that human problems, if approached scientifically by psychologic procedures, can and will be as readily solved as those pertaining to purely mechanical or material objects.

This reader was annoyed by the insertion of tables, diagrams, or graphs in the middle of a paragraph, a practice that tended to interrupt

the thought being developed in the text. This book has a very extensive bibliography and is well indexed.—*CLARK P. JEPPERS, Comdr., MC, USN*

PATHOLOGY SEMINARS, by *Lauren V. Ackerman,* M. D., *Arthur C. Allen,* M. D., *J. E. Ash,* M. D., *Arthur Purdy Stout,* M. D., and *Rupert A. Willis,* M. D. Edited by *Robert S. Haukohl,* M. S., M. D., and *W. A. D. Anderson,* M. A., M. D. 195 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1955. Price $10.

The importance of the clinical pathologic conference in medical teaching is well established, and the increasing number of medical journals which include at least one such conference in each regular issue indicates growing interest in the publication of this type of educational activity. "Slide Seminars," which develop as a postgraduate course of study among pathologists, are closely related and have become more and more popular. Such seminars are far more than mental gymnastics or opportunities for exhibiting diagnostic acumen on the part of the chief discussant, for they allow wide participation by those who attend, both by study of the material presented before the meetings take place and also in the selection of the material to be presented. The editors of this book have done a great service to medicine in initiating the publication of "Slide Seminars," and it is earnestly hoped that this work will stimulate further similar publications. Publication of well-organized "Slide Seminars" makes wider participation possible, and even though this is passive, it is of value.

Lesions usually studied at such conferences are not those which are routine in the experience of most pathologists. Rather, they present problems in diagnosis because of the infrequency of their occurrence or because they do not conform strictly to definitive lesions. Such lesions are not dealt with, at least not in much detail, in textbooks. The views of several experts, together with a rationale for the expressed views, can be very informative and lead to better general understanding of pathologic processes that are difficult to interpret.

It is fortunate indeed that such recognized authorities as Drs. Lauren V. Ackerman, Arthur C. Allen, J. E. Ash, Arthur Purdy Stout, and Rupert A. Willis were chosen to conduct the seminars for this publication.

While it is true, as the editors state, that the reader cannot obtain the same stimulation and pleasure enjoyed by the participants in the seminars at the time of their presentation, much of the essential value is preserved in the written record. A part of this stimulation and pleasure is due to the informality of the discussions. As a result, the individuality of the discussants is better revealed than is possible in completely organized discussions. However, it is recognized that individuals differ in their ability to achieve smoothness and perfect literary composition in informal discussions, and while this may not be

too apparent in the spoken word, it is evident in the written. It is felt that editing the discussions for publication, so that none may suffer by comparison, will not seriously impair the preservation of individuality.

Excellent photomicrographs have been used throughout this book; the printing is clear and binding is substantial; there is an adequate index. Pertinent references are placed at the end of each discussion. This book is highly recommended as a reference for pathologists in the disposition of perplexing problems of diagnosis and for clinicians who wish to add to their general knowledge and understanding of pathologic processes.—*WILMOT F. PIERCE, Capt., MC, USN*

THE YEAR BOOK OF OBSTETRICS AND GYNECOLOGY (1955-1956 Year Book Series). Edited by *J. P. Greenhill*, M. D., F. A. C. S. 544 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1955. Price $6.

In writing a review of this book I find that my enthusiasm must be tempered to prevent my writing advertising copy. Continuing the high quality of previous years, it is a condensed digest and analysis of the world literature on obstetrics and gynecology that is deemed most important and of most consequence and usefulness to the general practitioner, specialist, research man, and medical student.

The numerous discussions of the editor have an informal teaching charm that makes for easy reading. Many of the discussions refer to articles of previous years and correlate trends.

The section on the newborn is informative and clinically useful. It especially stresses perinatal morbidity and mortality, and emphasizes preventable causes and the need for larger research grants for study of the newborn. Articles on the current management of erythroblastosis are fully presented.

The gynecologic section presents a wide variety of useful subjects, from adolescent gynecology to geriatric gynecology. There is an excellent illustrated section on operative technics.

Accompanying the book is a printed slip containing 23 questions on current literature. It is recommended that in future series these be enlarged on and included at the back of the book. The "quiz" trend today is enjoyed as a challenge to one's knowledge and ego.

—*SAUL L. AVNER, Lt. Col., MC, USA*

OBSTETRICAL ANESTHESIA, Its Principles and Practice, by *Bert B. Hershenson*, M. D. With a Foreword by *Frederick C. Irving*, M. D. 403 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $9.50.

The author's approach to obstetric anesthesia is predominantly clinical. A brief historical background is given as an introduction to the many problems yet unsolved. The numerous factors of pain, fear, fever, metabolism, and sthenicity that affect the reflex irritability of the patient are correlated. The older theories concerned with the transmission

and perception of labor pain are enumerated and discussed in relation to modern theoretic and factual concepts.

The premedicating drugs employed during labor are considered to be part of the anesthetic plan and procedure. The uses and abuses of the various drugs are discussed individually and the author's favorite barbiturate-apomorphine-scopolamine premedication for uncomplicated vaginal delivery is outlined.

The classical signs and symptoms of general anesthesia and accompanying reflexes are discussed with emphasis on the importance of changing signs rather than isolated observations. Stages of anesthesia required for various obstetric procedures are tabulated. Respiratory and circulatory derangements incident to obstetric anesthesia are considered in relation to cause, prevention, and treatment. The existence of multiple factors leading to asphyxia neonatorum is emphasized, and the importance of alert teamwork in minimizing its hazards is considered mandatory.

The inhalation anesthetic agents are reviewed individually, and their uses and limitations are cited. It is the author's experience and conviction that the most controllable method of anesthesia, which will give the greatest measure of maternal protection in most circumstances, is inhalation anesthesia. The only italicized sentence in the book states that "all other inhalational agents must demonstrate some specific merit over ether when selected to produce anesthesia for a given obstetrical patient." The various regional anesthetic procedures and drugs are described and their uses outlined. There is an extensive review on the management of the obstetric patient with such complications as myasthenia gravis, heart disease, poliomyelitis, diabetes, and aspiration pneumonitis.

This book is clearly and forcefully written by a clinician for clinical instruction. The author will readily find converts who will join him in the belief that the administration of an anesthetic is a major therapeutic procedure which should be selected to fit the patient, and that the choice of anesthetic agent and technic must rest on the skill, experience, judgment, and mutual confidence of the obstetrician and the anesthesiologist working as a team. — *ROBERT E. LAU, Lt. Col., USAF (MC)*

THE SPINE, A Radiological Text and Atlas, by *Bernard S. Epstein,* M. D. 539 pages; 721 illustrations on 331 figures. Lea & Febiger, Philadelphia, Pa., 1955. Price $16.50.

This detailed study of the spine was primarily written as a radiologic text and atlas; however, its coverage of all of the known diseases of the spine is so complete that it would be of great value to specialists other than radiologists, especially orthopedic surgeons and neurosurgeons.

Perhaps the most outstanding aspect of this text is its wide coverage of all variations in the appearance of the spine, including the

normal appearance, congenital malformations, and changes related to disease. The bibliography is complete and all controversial subjects are adequately discussed. The embryologic discussion at the beginning of the book is considered to be most complete and is slanted to be of practical importance especially in relationship to congenital malformations and inflammatory disease. The illustrations are excellent and the particular point of interest in many cases is marked by an arrow.

The spine is studied as a separate body system. The bony shell and its contents are evaluated either individually or together, depending on whether the disease is one of generalized nature or is localized to the spinal system or to one of its component parts. This work admirably fulfills the goals set forth by the author and is highly recommended to all physicians. —*JAMES M. KEEGAN, Maj., USAF (MC)*

THE POSTURAL COMPLEX, Observations as to Cause, Diagnosis, and Treatment, by *Laurence Jones,* M. D. 156 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $9.75.

In his summary, the author of this book states that "certain portions may be so divergent as to severely strain credulity." Elsewhere he states that his "concepts as to cause, diagnosis, and treatment of symptoms arising from postural imbalance differ materially from present-day majority opinion." The personal reaction of this reviewer is that both of these statements are fully justified by the thesis as presented.

The author states that "internal rotation" of the calcaneus causes a "descent" of the sustentaculum tali, which, in turn, produces an "angular compression" of the neurovascular bundles lying in contact with the underside of the sustentacular shelf. At the same time, this internal rotation of the foot produces "serial distortions"; namely, in turn, "inward roll of the leg from top to bottom, pelvic rotation on the hip joint, increased lumbosacral angle, and variable nerve tensions." These aberrations he terms "the primary trigger mechanism." The distortions "progress from below upward and combine to produce elongating tensions which may be transmitted in varying degrees and locations to the entire central nervous system. After a varied time lapse, long-continued dysfunction due to angulation, torsion, and inequality of weight bearing may produce inflammation (noninfectious) of: (1) nerves (neuritis), (2) arteries and veins (arteritis and phlebitis), (3) muscles (myositis), (4) fascia (fibrositis), (5) ligaments (periarthritis), (6) joints (arthritis)." Thus, the author bases multitudinous affections of the musculoskeletal system on "internal rotation" of the feet.

Conversely, the answer provided by the author for these affections thus produced is a reversal of the serial distortions. This he provides by "postural shoe correction," first selecting a suitable shoe, reenforcing it with a rigid plastic fiberglass inset, adding outside corrections to the sole and heel, and then adding inside individual corrections. Complete details of this meticulous preparation of the shoes

are given, which would appear to require extensive training of skilled workmen equipped with special apparatus and materials not found in the usual cobbler's shop or brace shop.

The author has gone into the greatest detail to develop, explain, and justify his rather unorthodox theories and procedures. The text is profusely illustrated with excellent drawings, reproductions, and photographs. This reviewer found it readable and understandable although difficult to accept, but, in fairness, must admit to no personal experience with the procedures and to the possibility that they may be as effective as the author claims. It is considered to be a text suitable only for an experienced orthopedic surgeon with a background of extensive clinical practice, judgment, and ability to evaluate.

—*JOHN D. BLAIR, Col., MC, USA*

FORENSIC MEDICINE, A Textbook for Students and Practitioners, by Sir *Sydney Smith*, C. B. E., LL. D., and *Frederick Smith Fiddes*, O. B. E., M. D. 10th edition. 644 pages; 173 illustrations. Little, Brown & Co., Boston, Mass., 1955. Price $10.

The 10th edition of this standard British text brings it up to date so that it may continue in use as a teaching tool and ready reference in the field of forensic medicine. As the author points out, every physician is faced with problems of a forensic nature in his practice, and some specific knowledge in addition to general medical information and common sense is required in elucidating such problems before legal authorities. Although specific laws may vary with locale, the basic principles of medical evidence as outlined in this book are universally applicable. It is designed for the clinical practitioner rather than for the specialist, and the readability and simplicity of the text, augmented by usable charts and clear illustrations, make it an excellent source for prompt and reliable reference. In addition the statistical tables, appendixes, specific descriptions of various conditions, and clinical toxicology will prove of great value as reference material for those specializing in forensic medicine. The text is recommended for inclusion in medical libraries, for the reference shelf of physicians commonly faced with medicolegal problems, and as additional reading for students during courses in forensic medicine.—*ALAN RAFTERY, Comdr., MC, USN*

ADMINISTRATIVE MEDICINE, Transactions of the Third Conference, October 6, 7, and 8, 1954, Princeton, N. J. Edited by *George S. Stevenson*, M. D. 172 pages. Sponsored by the Josiah Macy, Jr. Foundation, New York, N. Y. Published by Josiah Macy, Jr. Foundation Publications, Packanack Lake, N. J., 1955. Price $3.

The participants of this conference represent a cross-section of some of the most outstanding authorities in the United States directly or indirectly related to the field of administrative medicine. The proceedings of this conference are published in order to share the experiences of these meetings with a larger audience. Although verbatim reporting has not been done, every effort has been made to preserve the spirit of the conference.

Here an excellent interchange of ideas has been brought about by the conferees in defining the special characteristics of medical administration. A wide variety of opinions are expressed in setting administrative medicine apart from the other fields of administration. Interestingly these differences have been shaded somewhat by the background and current field of endeavor of the individual participant—the medical administrator, the nonmedical administrator, the personnel director, and the sociologist.

Although a number of different interpretations are brought out, a general pattern of expression emerges relative to the problems of medical administration as distinct from other fields of administration. Most significant is the fact that in the former the objects which are administered are persons and in the latter they are things. Even more distinct is the fact that they are sick persons. Here an intangible personal service is rendered that cannot be weighed or packaged and that is difficult to evaluate.

The hospital has grown up over the years on a nonprofit basis and with a humanitarian approach as contrasted to the commercial organization which exists for only one reason—profit. And finally the task of the medical administrator, particularly the hospital administrator, is far more difficult than that of the business administrator in view of the multiple types of specialized personnel with whom he must deal, many of whom are rugged individualists. Keeping this team on a harmonious yet productive basis requires the many attributes and talents of a social engineer.

Other topics included a discussion of the distinctive characteristics and educational requirements of this unique field—medical administration, the principles and concepts of business administration as applied thereto, and the complexities involved in the adaption of the hospital to the environment of the community which it serves.

One of the most valuable contributions of this book is the chapter on the hospital and its relationship to the community, in which Dr. Ray E. Trussell relates his experiences in the establishment of a county medical center. This center exemplifies in its truest sense a community program of total medical care embracing all facets of preventive medicine and curative medicine. Most significant is the fact that this center has the solid backing of the entire community for which it most ably provides a well-balanced program of medical care of the highest caliber. The establishment of a central core of full-time medical specialists who maintain affiliation on the faculty of several university medical schools at considerable distance; the establishment of a rotational medical student, internship, and residency program with these schools; and the integration of the local general practitioners on the visiting staff of the center under the supervision of the permanent members of the staff are features of this program which place it in a category all of its own.—*BYRON L. STEGER, Col., MC, USA*

STUDIES IN THE FUNCTIONS AND DESIGN OF HOSPITALS. The Report of an Investigation sponsored by the Nuffield Provincial Hospitals Trust and the University of Bristol. 192 pages; illustrated. Geoffrey Cumberlege, Publisher to the University, Oxford University Press, Amen House, London E. C. 4. Distributed by Oxford University Press, Inc., New York, N. Y., 1955. Price $15.

This volume presents a five-year study of the functions and design of hospitals by a selected group of researchers in the field of hospital economics and planning. The investigators approached this problem from the following points of view: (1) Studies of individual departments, (2) studies of the physical environments, such as heating, lighting, ventilation, color, control of noise, fire prevention, et cetera; and (3) studies of hospital patient loads, *i. e.*, the demand for hospital services arising from the needs of the surrounding area. Although aware of the accumulated knowledge and experience of those in daily contact with hospital problems, their studies were aimed at the collection of data rather than of opinion. Opinions in these fields are abundant, but little factual data is available. The investigators hope that by forging as their principal aim the provision of data collection, it will enlighten hospital authorities, staffs, and architects confronted by many complex problems, and may stimulate and encourage the creation of new designs and improved methods of operation for solution of these intricate problems.

This study has excellent diagrams depicting the pattern of movement of personnel in the hospitals, architectural drawings of experimental wards, functional charts of the effectiveness of good planning to facilitate the operation of an outpatient service, modern layouts of operating suites, and extensive investigative data on physical environment within the hospital.

This book is an excellent source of hospital function studies and a valuable addition to the reference library for hospital construction, design and function. It is strongly recommended to the students of hospital administration and for all hospital libraries.

—*JOSEPH R. VIVAS, Col., MC, USA*

MOSQUITOES, Their Bionomics and Relation to Disease, by *William R. Horsfall.* 723 pages. The Ronald Press Co., New York, N. Y., 1955. Price $16.

This book is a very comprehensive treatise on the bionomics of mosquitoes and their relation to disease transmission. It covers an important area of the broad field of culicidology which has long been in need of consolidation into a single authoritative reference. The author has made an exhaustive study of the literature and has also drawn upon his own experience.

This text is applicable to the entire known fauna of the subfamily Culicinae. It will be most useful to epidemiologists, sanitarians, entomologists, ecologists, and collectors. It is particularly useful as a starting point for new investigations and will relieve the researcher of

much time-consuming work in gathering background data which is already well known. The extensive index of genera and species should also prove to be a most valuable reference. This monograph is, without a doubt, the only authoritative and comprehensive reference to date on the bionomics of the Culicinae of the world.

—WALTER J. LA CASSE, Lt. Col., USAF (MSC)

CANCER CELLS, by *E. V. Cowdry.* 677 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955.

This book, written by a well-known authority, is a masterful attempt to summarize our present knowledge of cancer, its causes, treatment, and diagnosis. It is an up-to-date compilation of the many and varied facets of this dread disease.

Because in a few hundred words one cannot adequately summarize and review a textbook of 677 pages which, in itself, is a summation and a digest of the many investigations in oncology, it seems best to present the book's organization. The first chapter gives a brief discussion of benign and malignant tumors. The next five chapters are devoted to the discussion of the properties of malignant cells, and include a comparison between the normal and malignant cells. In the succeeding 10 chapters, the author discusses carcinogens, susceptibility of normal cells to carcinogens, duration of latency in cancer development, factors modifying the production of cancer, and the geographic frequency of different types of cancer. The final four chapters very briefly discuss diagnosis, prevention, and treatment of cancer and cancer research. At the conclusion of each chapter the author summarizes his discussions. This should be of great help to the reader who wishes a concise interpretation of the contents.

The book is well organized with a helpful table of contents, subject index, and an extremely valuable bibliography. There are relatively few misspelled words and typographical errors, which do not detract from the value of this timely book.

The printing and most of the illustrations are of excellent quality; most of the tables can be readily understood. The author has a style of writing which stimulated and provoked this reviewer's interest to explore further this seemingly insoluble mystery of the cancer problem. This book should be of great value to the clinician as well as to the cancer research worker, and should be a worthy addition to the medical library. *—CHARLES J. FARINACCI, Col., MC, USA*

SALIVARY GLAND TUMORS, by *Donald E. Ross,* M. D., F. A. C. S., F. I. C. S., F. R. C. S. (Eng.), F. R. C. S. (Edin.). 86 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $7.50.

This monograph was written by a surgeon and will be of interest primarily to surgeons. The stated objective of the author is "to emphasize the anatomy of this area and pathological behavior of the tumors." His surgical technic for removal of parotid tumors is described

in association with drawings progressively demonstrating the procedure. Final chapters are devoted to consideration of procedures helpful in cases of facial nerve paralysis and to the role of radiation in the treatment of salivary gland tumors.

Unfortunately some of the organization of the subject matter seems to get lost in the conversational narration which characterizes this treatise, but this criticism is offset to a considerable degree by the reader appeal such a style possesses. It is also believed that the illustration of salivary tumor lesions by colored rather than black and white photomicrographs would have increased the value of this volume. The anatomic illustrations are ample and excellent.

Clinical experience of the author with his subject is emphasized by the fact that at the time of publication he had personally cared for 138 cases of, and performed 156 operations for, salivary gland tumors. His own material is reviewed in detail after general discussion of salivary tumor pathology and appears to support his conclusions, which, gleaned from the narration, are: (1) A greater number of complete parotidectomies should be performed for benign tumors; (2) block neck dissection should be performed in every proven case of salivary cancer; and (3) sacrifice of the facial nerve is rarely necessary and should be limited to instances when it is infiltrated by malignancy.

This little book is of distinct value to every practicing surgeon who performs operative procedures on the salivary glands. It combines, under one cover, much of the information required for preoperative review and includes a valuable bibliography of 393 papers related to this subject. —*JAMES P. JERNIGAN, Lt. Col., USAF (MC)*

ANALYTICAL CYTOLOGY, Methods for Studying Cellular Form and Function, edited by *Robert C. Mellors,* M. D., Ph. D.; foreword by *Francis O. Schmitt,* Ph. D. 522 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $15.

This book brings together, under one cover, physical and chemical knowledge, with emphasis on physical methods, that can be applied to the analysis of cellular structure and function. Nine chapters by American and European workers present: (a) methods in the optical spectrum with cytophotometry, chemical staining, and microscopy concerned with phase-contrast, interference-contrast, polarization, fluorescence, and ultraviolet microabsorption procedures; and (b) methods in the higher energy spectrum of electrons, x-rays, and gamma and alpha particles concerned with electron microscopy, radioautography, historadiobiology, and x-ray diffraction.

Most of the material was written in 1952 or before, but the long lists of excellently chosen references have "additional references" for 1954 and even for 1955 (in press).

Because cellular study now goes far beyond mere form, methods for studying such things as macromolecular structures and sites of energy

turnover and biosynthesis are important. For instance, fibrous-proteins and lipid proteins, formerly postulated by physiologists, can now be differentiated by their morphology as seen in the electron microscope; and highly sensitive visual optical technics allow analysis of living cells. Often the procedures are so lucidly and sufficiently described that the reader can go directly into the laboratory and successfully apply them. This book will be a necessary as well as a stimulating reference work in every progressive laboratory in which tissues are scientifically studied.—*ELBERT DeCOURSEY, Brig. Gen., MC, USA*

NEUROCHEMISTRY, The Chemical Dynamics of Brain and Nerve, edited by *K. A. C. Elliott, Irvine H. Page,* and *J. H. Quastel.* 900 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $19.50.

This volume endeavors to present current knowledge and trends in the rapidly expanding field of chemistry of the nervous system. The book comprises 32 individual articles written by men who are recognized authorities in their special fields. Areas covered include chemical constituents of brain and nerve; various metabolic processes of the nervous system in normal and abnormal states; the biochemical aspects of convulsive phenomena, narcosis, demyelination, and neuromuscular disorders; the neurochemical effects of drugs, bacterial toxins, and snake venom; and the physiologic significance of acteylcholine, adrenaline and noradrenaline, steroid hormones, electrolytes, and other blood elements with special emphasis on correlating biochemical events with behavioral disorders.

For the clinician, such as the reviewer, who is far removed in years from the laboratory, this publication is only of limited value due to a relative unfamiliarity with a special language, chemical formulas, and modern concepts of biochemistry. Moreover, it should be recognized that the volume is not a systematic and organized treatment of neurochemistry but a series of articles on highly specialized phases of chemistry of the nervous system. There is no attempt to fit the pieces together into a framework that could be meaningful for the clinical psychiatrist. Articles concerning the chemistry of several neurologic syndromes such as convulsive seizures, neuromuscular disorders, paralysis due to toxins, and the like are more pertinent particularly for the practicing neurologist. Undoubtedly, the book will be of greatest interest to the investigators in brain and nerve chemistry and related fields, for in one compact volume there is gathered most of the known data in this sphere with bibliographic entries as recent as 1954. It is apparent that neurochemistry, like other phases of cellular chemistry, is greatly handicapped by the lack of suitable methods for studying the biochemical processes occurring within the living cell. An evaluation of the present basic technics used in neurochemical research, and the possible future application of recent microanalytic technics might have been valuable additions to this book.—*ALBERT J. GLASS, Col., MC, USA*

CIBA FOUNDATION COLLOQUIA ON AGEING, Volume I, General Aspects, by editors for the Ciba Foundation, *G. E. W. Wolstenholme,* O. B. E., M. A., M. B., B. Ch., and *Margaret P. Cameron,* M. A., A. B. L. S. 268 pages; 38 illustrations. Little, Brown & Co., Boston, Mass., 1955. Price $6.75.

The contents of this volume are diverse. The contributors are from medical centers in all parts of the world and thus bring together many and varied opinions of international authorities in this increasingly important field.

The topics discussed include: Definition and measurement of senescence, pathologic basis of ageing, mental aspects, effects of ageing on respiratory function, changes with age in diffusion coefficients of solutes in human tissue membranes, vascular lesions of the skin, ageing of elastic tissue, calcium metabolism, 17-ketosteroid excretion, tissue transplantation technic applied to the problem of the ageing of the organs of reproduction, preservation of tissue, research areas in geratology nutrition, too rapid maturation in children, psychologic aspects, and adrenocortical reactivity in aged schizophrenic patients.

Especially interesting are the discussions presented at the end of each article by various other people present. Some of the work presented is beyond the scope of the average practicing physician, internist, or geriatrician as far as assisting them in treating the aged, but the papers are understandable to all physicians. The book should be interesting, not only to those in the field of geriatrics, but to all physicians. This is especially true now that our population of aged is increasing steadily and the problems of ageing are reaching greater proportions.

—*DAVID L. DEUTSCH, Lt. Col., MC, USA*

THE COMPLETE MEDICAL GUIDE, by *Benjamin F. Miller,* M. D. 913 pages; illustrated. Simon & Schuster, Inc., New York, N. Y., 1956. Price $4.95.

This book is interesting, easy to read, well worth its price, and can be recommended to any family.

It was written for the use and guidance of the entire family. The author discusses and gives advice as to the general care of the body at home, at work, and at play. Psychiatric conditions are explained in simple terms. The basic emotions and needs in infancy, childhood, adolescence, adulthood, marriage and parenthood, et cetera, are discussed at length.

Other than emergency first aid, treatment is discussed in very general terms. Instruction on home nursing, however, is well covered. Information is included concerning periodic medical check-ups as a preventive measure, how to recognize illness early, when and how to see and select one's own doctor.

The line drawings throughout the book clearly illustrate what is intended. A large glossary and index permit easy use of the book by nonmedical persons.—*PATRICK I. McSHANE, Col., MC, USA*

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

A MANUAL OF FRACTURES AND DISLOCATIONS, by *Barbara Bartlett Stimson,* M. D., Med. Sc. D., F. A. C. S. 3d edition. 224 pages; 97 illustrations. Lea & Febiger, Philadelphia, Pa., 1956. Price $4.50.

GUIDANCE IN GROUPS, A Resource Book for Teachers, Counselors, and Administrators, by *Margaret E. Bennett,* Psychologist. Supplemented by A Human-Relations Program, by *Celia F. Johnson.* 411 pages. McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $5.50.

AN ATLAS OF OTOLARYNGIC PATHOLOGY, by Colonel *J. E. Ash,* R. A. (Ret'd), M. D., Former Scientific Director, American Registry of Pathology, and *Muriel Raum,* M. D., Former Registrar, Registry of Otolaryngic Pathology. Published under the joint sponsorship of The American Academy of Ophthalmology and Otolaryngology, The American Registry of Pathology, and The Armed Forces Institute of Pathology. 572 pages; 2,024 figures on 420 plates (2 color). American Registry of Pathology of the Armed Forces Institute of Pathology, Washington, D. C., 1956. Price $20.

DISEASES OF THE LIVER AND BILIARY SYSTEM, by *Sheila Sherlock,* M. D. (Edin.), F. R. C. P. (Lond.). 720 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $10.

PSYCHOPATHOLOGY OF CHILDHOOD, edited by *Paul Hoch,* M. D., and *Joseph Zubin,* Ph. D. The Proceedings of the Forty-Fourth Annual Meeting of the American Psychopathological Association, Held in New York City, June 1954. 303 pages. Grune & Stratton, Inc., New York, N. Y., 1955. Price $6.

DISEASES OF THE ENDOCRINE GLANDS, by *Louis J. Soffer,* M. D., F. A. C. P., with *J. Lester Gabrilove,* M. D., F. A. C. P., and the Section on Gonads by *Arthur R. Sobval,* M. D., F. A. C. P. 2d edition. 1,032 pages; 102 illustrations and 3 plates in color; 28 tables. Lea & Febiger, Philadelphia, Pa., 1956. Price $16.50.

PREPARING FOR MOTHERHOOD, A Manual for Expectant Parents, by *Samuel R. Meaker,* M. D. 196 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $2.

THE COMPLETE MEDICAL GUIDE, by *Benjamin F. Miller,* M. D. 913 pages; illustrated. Simon & Schuster, Inc., New York, N. Y., 1956. Price $4.95.

ROENTGEN INTERPRETATION OF FRACTURES AND DISLOCATIONS, by *Joseph Levitin,* M. D., and *Ben Colloff,* M. D. 265 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $8.50.

SHOCK AND CIRCULATORY HOMEOSTASIS, Transactions of the Fourth Conference, December 6, 7, and 8, 1954, Princeton, N. J. Edited by *Harold D. Green,* M. D. 291 pages; illustrated. Sponsored by the Josiah Macy, Jr. Foundation, New York, N. Y., 1955. Price $5.

HANDBOOK OF TOXICOLOGY, Volume I, Acute Toxicities of Solids, Liquids, and Gases to Laboratory Animals. Edited by *William S. Spector.* Prepared under the Direction of the Committee on the Handbook of Biological Data, Division of Biology and Agriculture, The National Academy of Sciences, The National Research Council. 408 pages. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $7.

A COURSE IN PRACTICAL THERAPEUTICS, by *Martin Emil Rehfuss,* M. D., F. A. C. P., LL. D. (Hon.), *Alison Howe Price,* M. D., and 24 contributors. 3d edition. 972 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1956. Price $15.

DIAGNOSIS AND TREATMENT OF VASCULAR DISORDERS (ANGIOLOGY), edited by *Saul S. Samuels,* A. M., M. D., F. A. C. A., F. A. C. C., with 17 contributors. 621 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1956. Price $16.

PRINCIPLES OF RENAL PHYSIOLOGY, by *Homer W. Smith,* Sc. D., M. D. (Hon.). 237 pages; illustrated. Oxford University Press, New York, N. Y., 1956. Price $5.

REGENERATION IN THE CENTRAL NERVOUS SYSTEM, by 33 *Contributors.* Edited by *William F. Windle,* Ph. D., Sc. D. Foreword by *Pearce Bailey,* Ph. D., M. D. 311 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $9.50.

CLINICAL MANAGEMENT OF RENAL FAILURE, by *Maurice B. Strauss,* M. D., and *Lawrence G. Raisz,* M. D. American Lecture Series, Publication No. 284, A Monograph in American Lectures in Urology, edited by *Reed M. Nesbit,* M. D. 114 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $2.75.

SURGICAL DIAGNOSIS, by *Philip Thorek,* M. D., with drawings by *Carl T. Linden.* 320 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1956. Price $12.

CLINICAL LABORATORY DIAGNOSIS, by *Samuel A. Levinson,* M. S., M. D., Ph. D., and *Robert P. MacFate,* Ch. E., M. S., Ph. D. 5th edition. 1,246 pages; 244 illustrations and 13 plates, 11 in color. Lea & Febiger, Philadelphia, Pa., 1956. Price $12.50.

WORLD-ATLAS OF EPIDEMIC DISEASES, Part II, Second Issue, edited by Professor Dr. med. *Ernst Rodenwaldt,* under the Sponsorship of the *Heidelberger Akademie Der Wissenschaften.* 162 pages; 10 colored maps. Falk-Verlag, Hamburg 1, Germany, 1954. Price 57.50 Deutsche marks, plus extra charge for postage and packing.

WORLD-ATLAS OF EPIDEMIC DISEASES, Part II, Third Issue, edited by Professor Dr. med. *Ernst Rodenwaldt,* under the Sponsorship of the *Heidelberger Akademie Der Wissenschaften.* 150 pages; 10 colored maps. Falk-Verlag, Hamburg 1, Germany, 1954. Price 57.50 Deutsche marks, plus extra charge for postage and packing.

THE DOCTORS MAYO, by *Helen Clapesattle.* A pocket book edition. 484 pages. Pocket Books, Inc., New York, N. Y., 1956. Price $0.50.

DISEASES OF THE CHEST, by *H. Corwin Hinshaw,* M. D., Ph. D., and *L. Henry Garland,* M. B., B. Ch. 786 pages; 634 illustrations on 288 figures. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $15.

CLINICAL ELECTROCARDIOGRAPHY, Part I, The Arrhythmias, With an Atlas of Electrocardiograms, by *Louis N. Katz,* M. A., M. D., F. A. C. P., and *Alfred Pick,* M. D. 737 pages; 415 illustrations. Lea & Febiger, Philadelphia, Pa., 1956. Price $17.50.

LYMPHOGRANULOMA VENEREUM, by *R. V. Rajam* and *P. N. Rangiah,* from the Venereal Diseases Department, Government General Hospital, Madras, India. Monograph Series: No. 1. Supplement to Indian Journal of Dermatology & Venereology, Bombay (Vol. 21, No. 4, Oct.-Dec. 1955). 80 pages; illustrated. Published by Medical Digest, Bombay 4, India, 1955.

ALCOHOLISM, Its Psychology and Cure, by *Frederick B. Rea.* 143 pages. Philosophical Library, New York, N. Y., 1956. Price $3.50.

A MODERN PILGRIM'S PROGRESS FOR DIABETICS, by *Garfield G. Duncan,* M. D. 222 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956.

EXCITABILITY OF THE HEART, by *Chandler McC. Brooks,* Ph. D., *Brian F. Hoffman,* M. D., *E. E. Suckling,* M. Sc., M. E. E., and *Oscar Orias,* M. D. With a Foreword by *Carl J. Wiggers,* M. D. 373 pages; illustrated. Grune & Stratton, New York, N. Y., 1955. Price $6.50.

ALLERGY IN CHILDHOOD, by *Jerome Glaser,* M. D. American Lecture Series, Publication No. 272, A Monograph in The Bannerstone Division of American Lectures in Allergy, edited by *Max Samter,* M. D. 529 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $12.50.

CURRENT THERAPY, 1956, Latest Approved Methods of Treatment for the Practicing Physician, edited by *Howard F. Conn,* M. D., and 12 consulting editors. 632 pages. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $11.

PEDIATRIC X-RAY DIAGNOSIS, A Textbook for Students and Practitioners of Pediatrics, Surgery and Radiology, by *John Caffey,* M. D. 3d edition. 1,059 pages; 2,264 illustrations on 1,267 figures. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $28.

THE RELATIONSHIP BETWEEN SYRINGOMYELIA AND NEOPLASM, by *Charles M. Poser,* M. D. American Lecture Series, Publication No. 262, A Monograph in American Lectures in Neurology, edited by *Charles D. Aring,* M. D. 98 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $3.50.

OUR BLIND CHILDREN, Growing and Learning With Them, by *Berthold Lowenfeld,* Ph. D. With a foreword by *Herbert R. Stolz,* M. D. 205 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $5.50.

TECHNIQUES IN BLOOD GROUPING, by *Ivor Dunsford* and *C. Christopher Bowley,* M. B., B. S., with a preface by *R. R. Race,* F. R. S. 250 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $4.50.

THE YEAR BOOK OF THE EYE, EAR, NOSE AND THROAT (1955-1956 Year Book Series). The Eye, edited by *Derrick Vail,* M. D., D. Oph. (Oxon.), F. A. C. S., F. R. C. S. (Hon.). The Ear, Nose and Throat, edited by *John R. Lindsay,* M. D. 471 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $6.50.

OPERATIVE TECHNIC IN SPECIALTY SURGERY, edited by *Warren H. Cole,* M. D., F. A. C. S., with 67 contributing authors. A Companion Volume to Operative Technic in General Surgery, published October 1955. 2d edition. 967 pages; illustrated. Appleton-Century-Crofts, Inc., New York, N. Y., 1956. Price $20. ($37.50 for the 2-volume set.)

THE CELLULAR BASIS OF WOUND REPAIR, by *Martin Allgower,* M. D. 125 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $6.50.

U. S. GOVERNMENT PRINTING OFFICE : 1956 O - 382424